Southern Medical Journal

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NOVEMBER 1959

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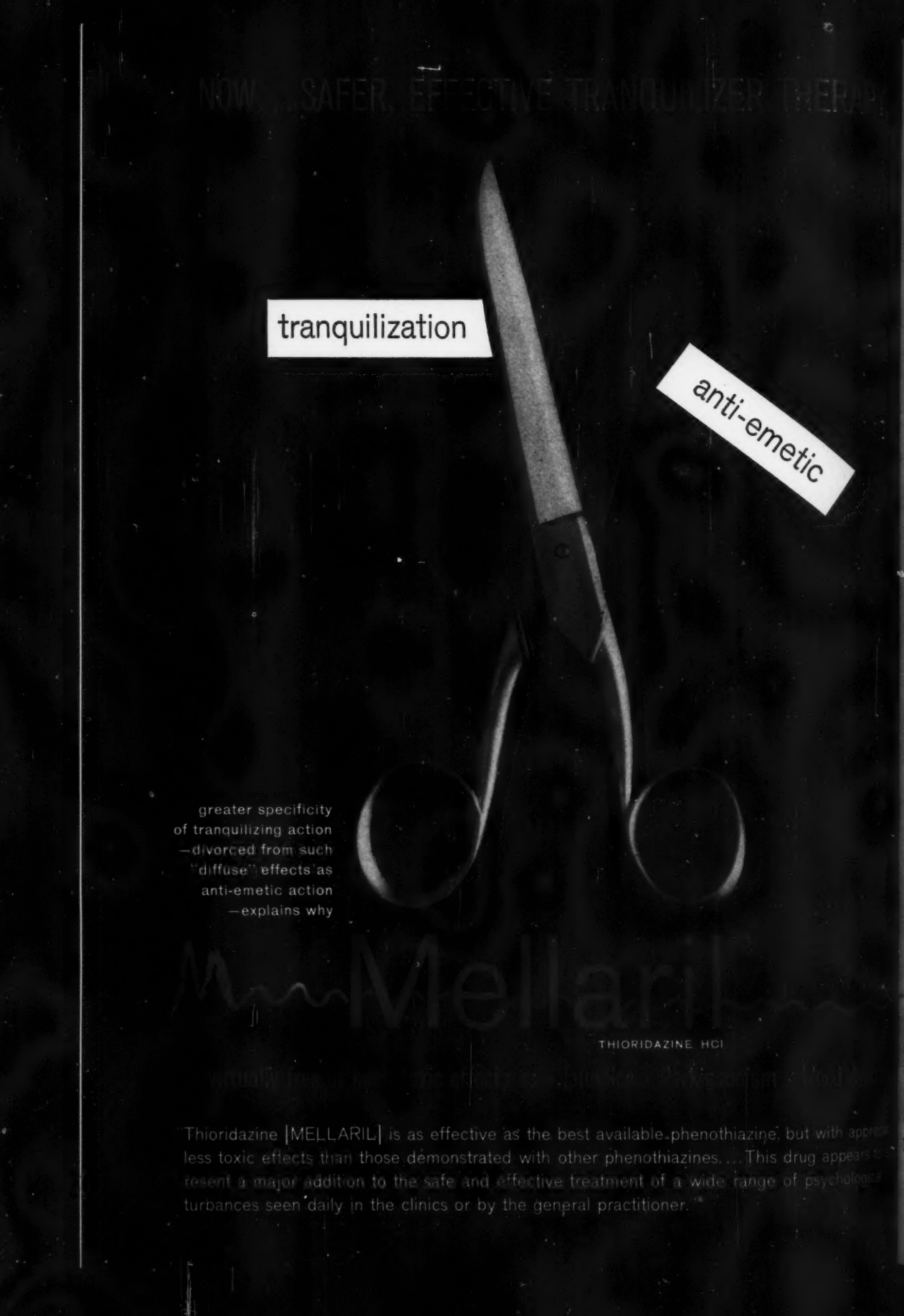
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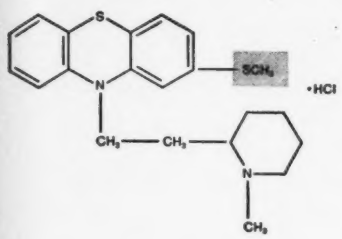

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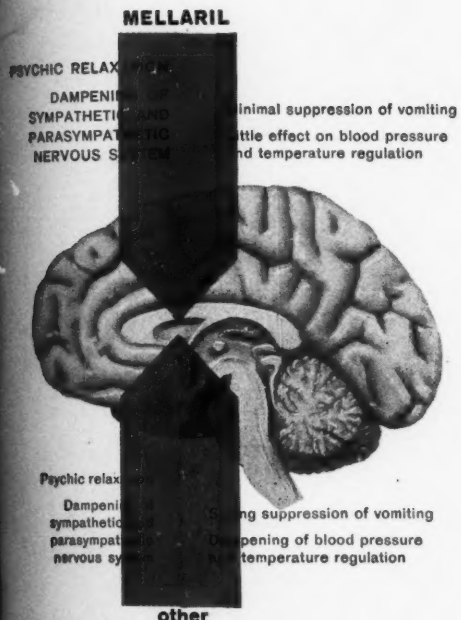

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[1] Hatfield, A. M.: Scientific Exhibit, American Academy of General Practice, San Francisco, April 6-9, 1959.

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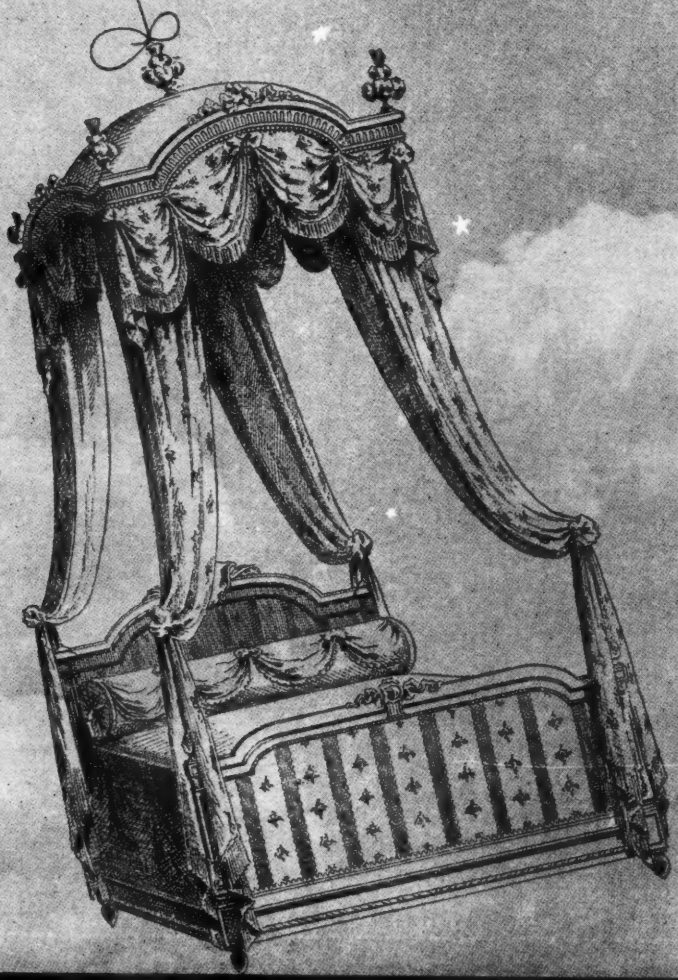

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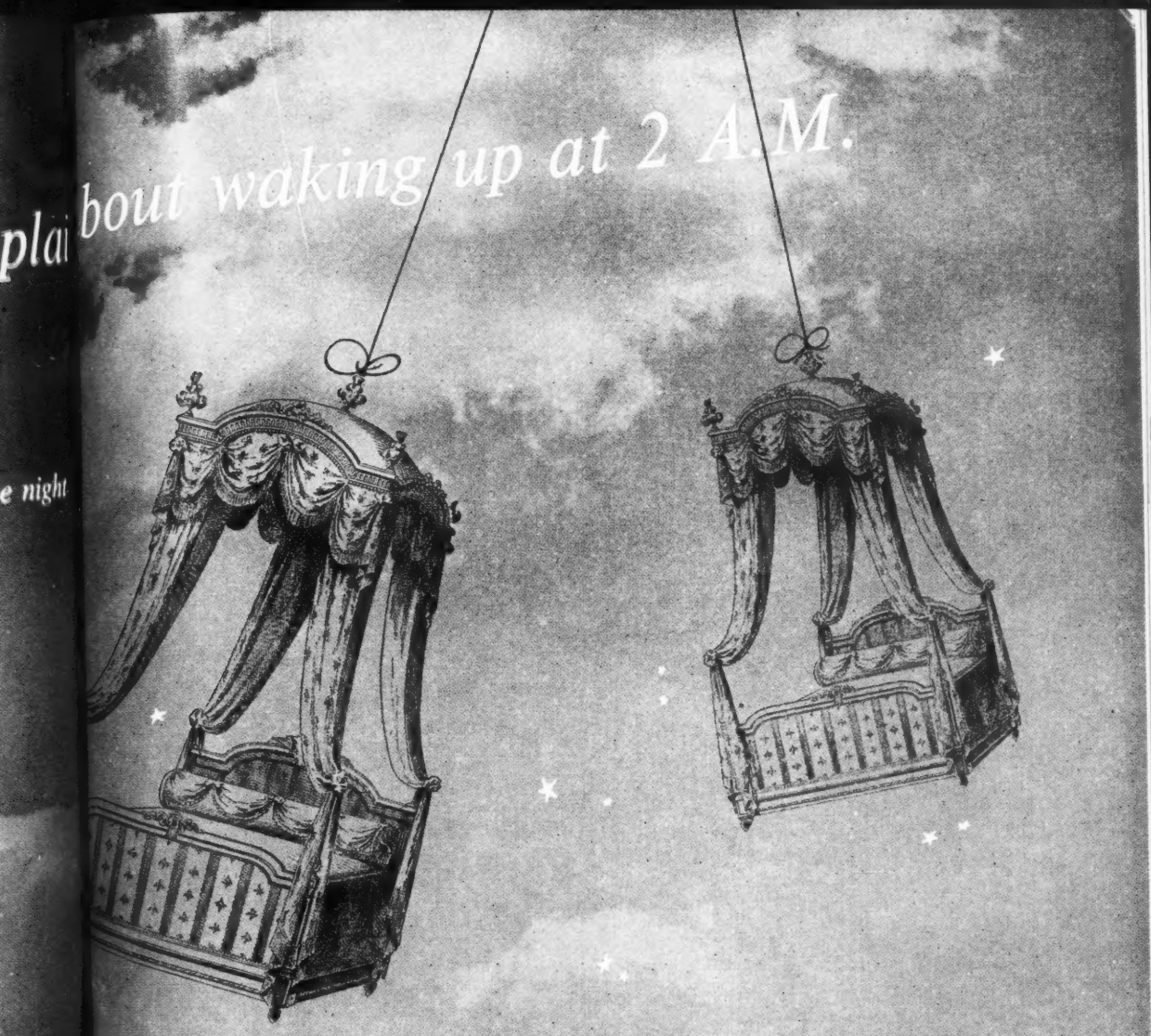

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1 Schlesinger, E. B.: Tr. New York Acad. Sc. 2:6, (Nov.) 1948.
2 Richards, R. K., and Taylor, J. D.: Anesthesiology 17:414, 1956.
3 Shideman, F. E.: Postgrad. Med. 24:207, 1958.
4 Berger, F.: Pharmacol. Rev. 1:243, 1949.

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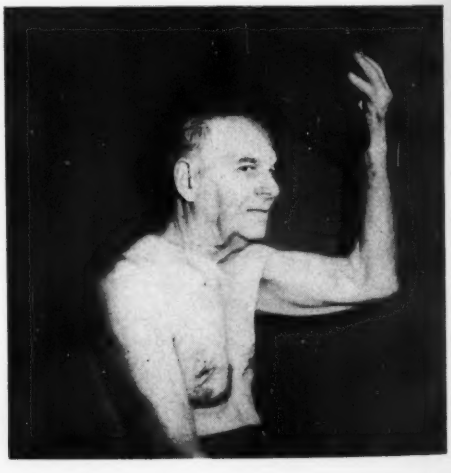

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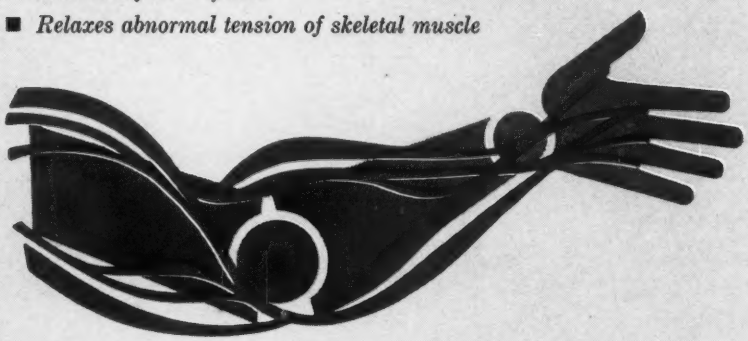

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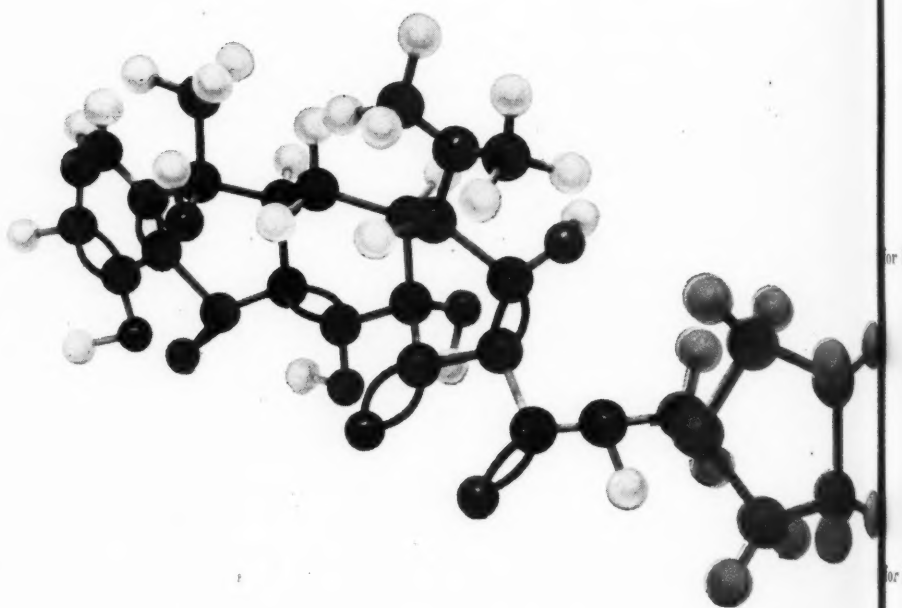

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1. Gottstein, W. J.; Minor, W. F., and Cheney, L. C.: J. Am. Chem. Soc. **81**:1198, 1959.

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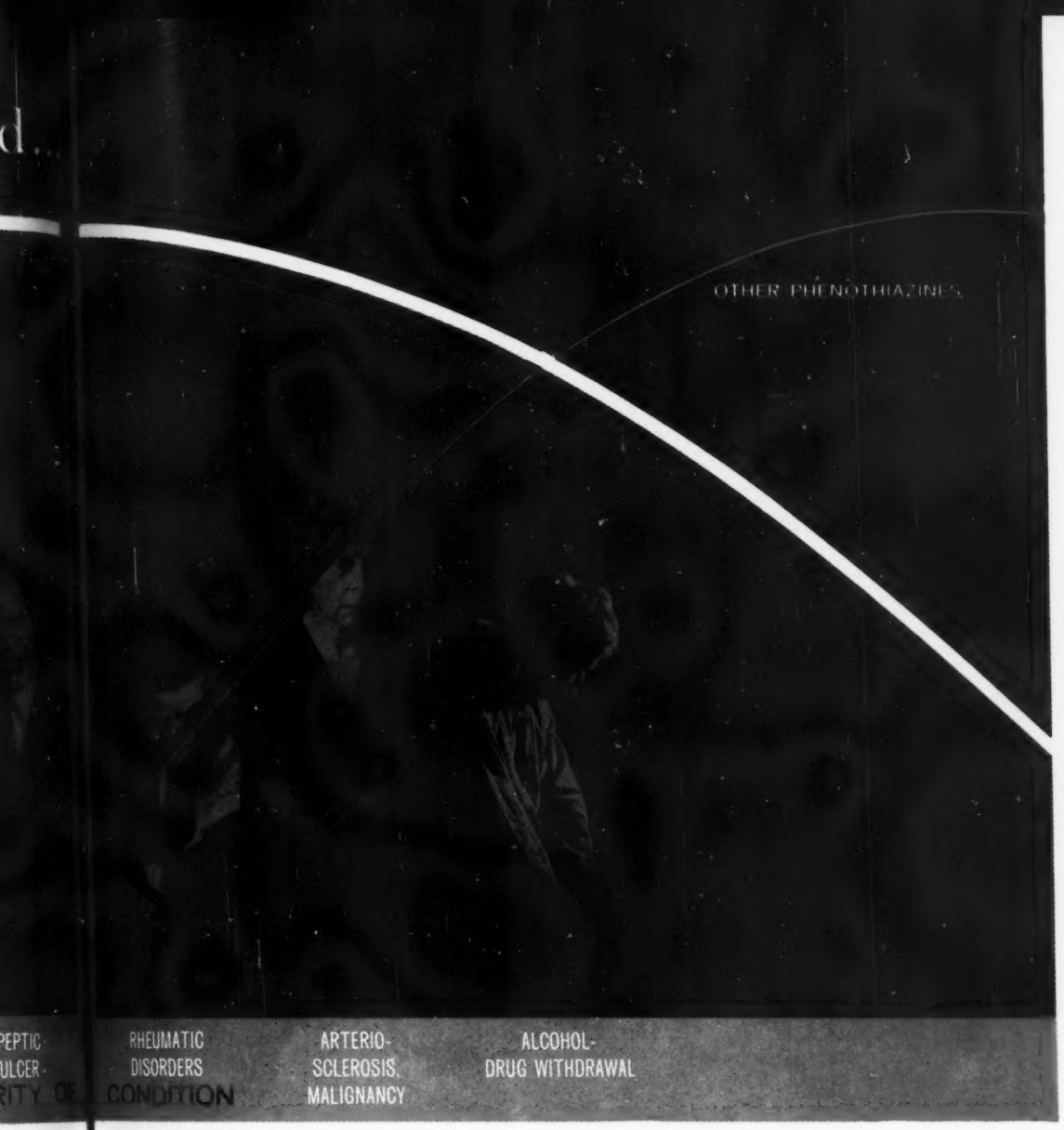

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1. Bodi, T., and Levy, H.: Clinical report, cited with permission. 2. Wetzler, R. A., and Phillips, R. M.: Clinical report, cited with permission. 3. Prigot, A.: Clinical report, cited with permission. 4. Gosline, E., *et al.*: *Am. J. Psychiat.* 115:939 (April) 1959. 5. Turvey, S. E. C.: Clinical report, cited with permission.

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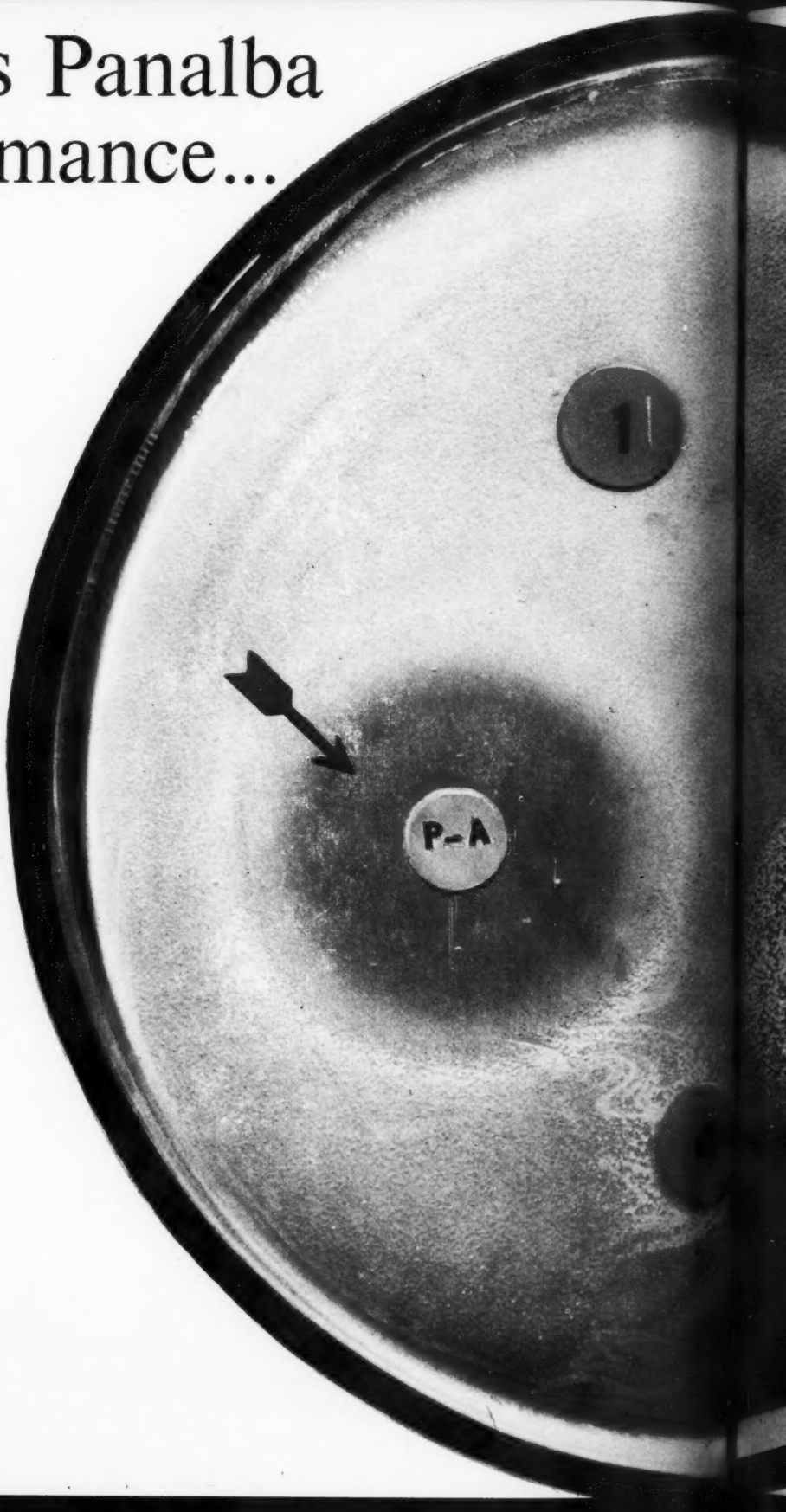

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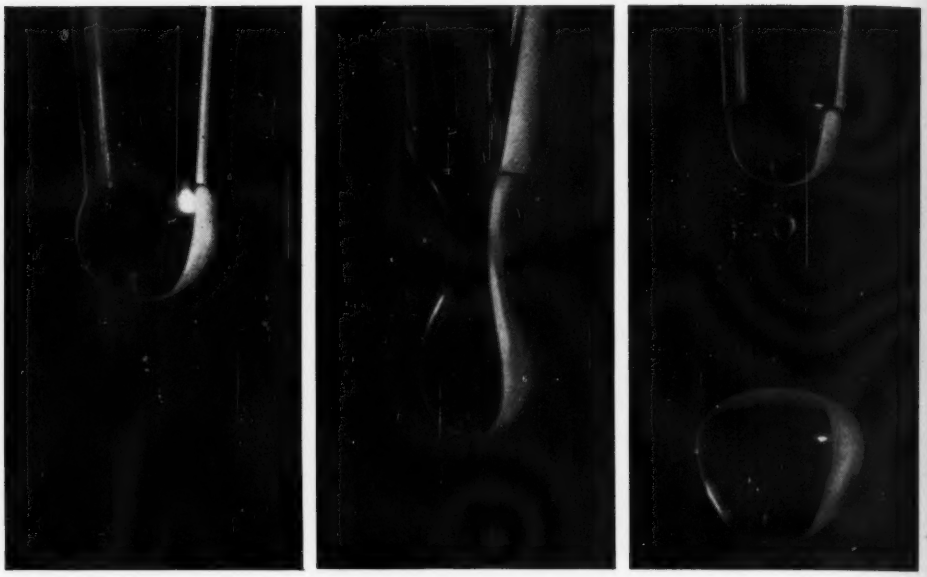

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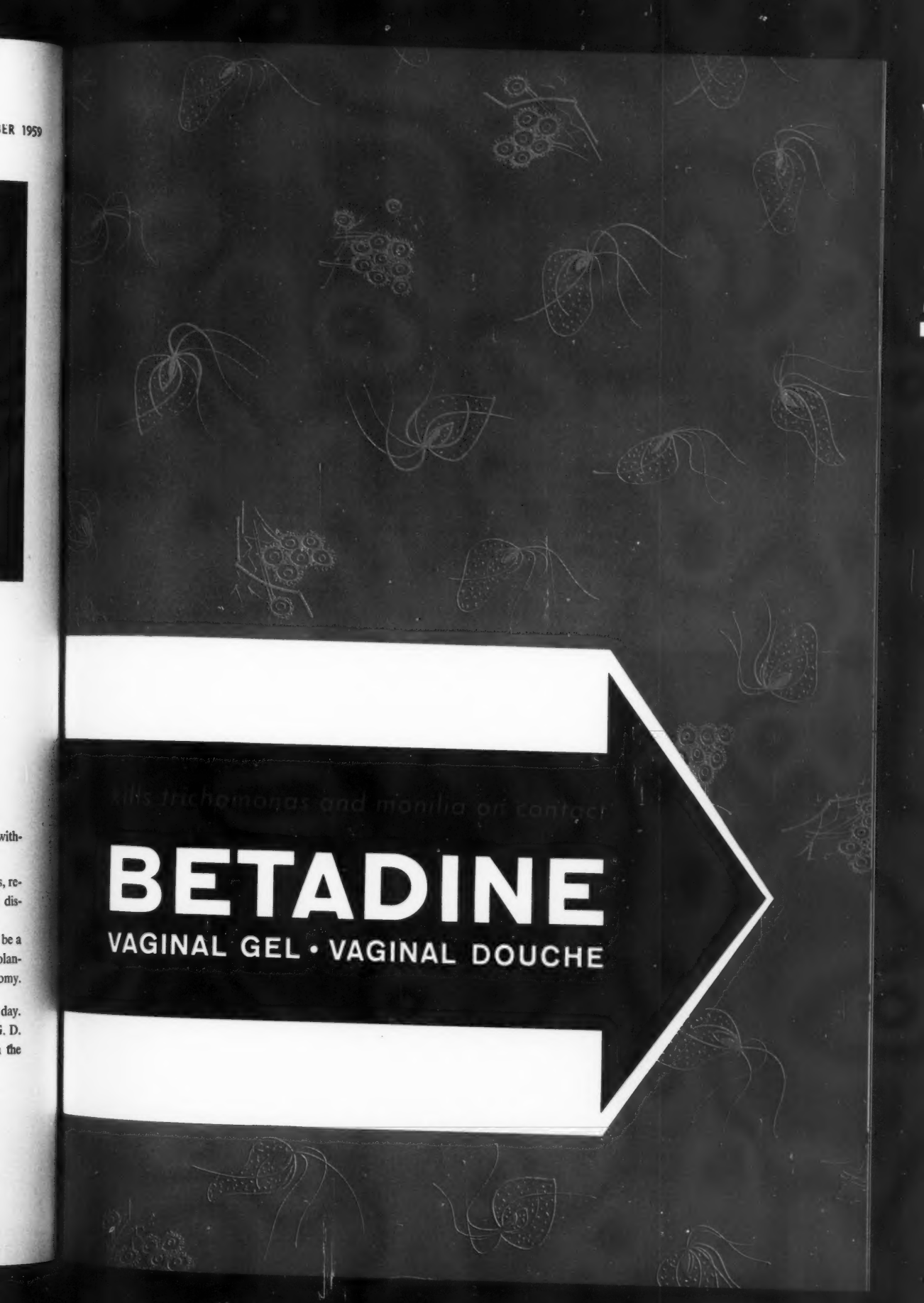
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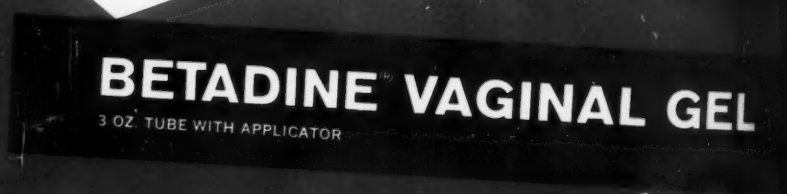

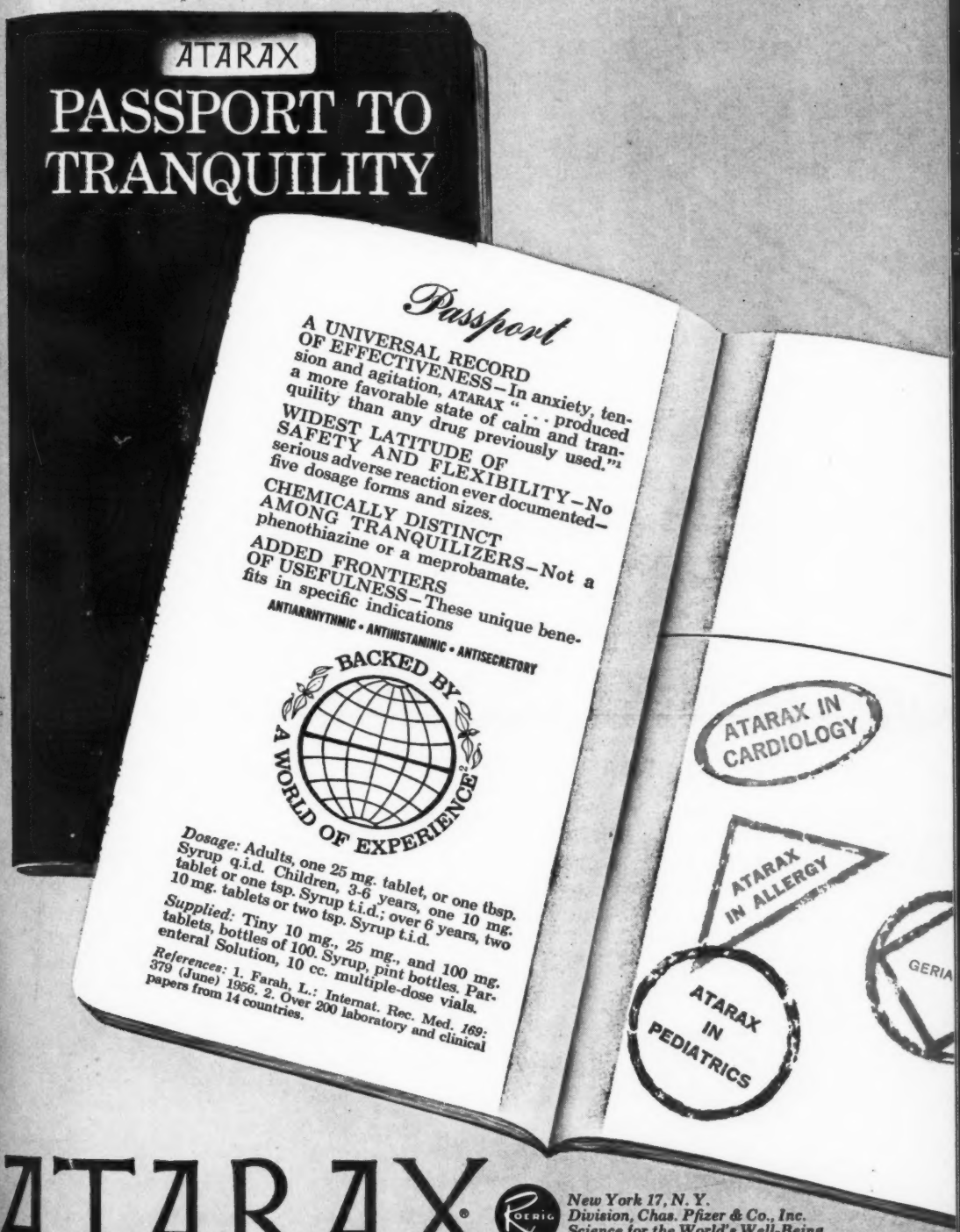
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Passport
A UNIVERSAL RECORD OF EFFECTIVENESS—In anxiety, tension and agitation, ATARAX "... produced a more favorable state of calm and tranquility than any drug previously used."1
WIDEST LATITUDE OF SAFETY AND FLEXIBILITY—No serious adverse reaction ever documented—five dosage forms and sizes.
CHEMICALLY DISTINCT AMONG TRANQUILIZERS—Not a phenothiazine or a meprobamate.
ADDED FRONTIERS OF USEFULNESS—These unique benefits in specific indications
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BACKED BY A WORLD OF EXPERIENCE
Dosage: Adults, one 25 mg. tablet, or one tbsp. Syrup q.i.d. Children, 3-6 years, one 10 mg. tablet or one tsp. Syrup t.i.d.; over 6 years, two 10 mg. tablets or two tsp. Syrup t.i.d.
Supplied: Tiny 10 mg., 25 mg., and 100 mg. tablets, bottles of 100. Syrup, pint bottles. Parenteral Solution, 10 cc. multiple-dose vials.
References: 1. Farah, L.: Internat. Rec. Med. 169: 379 (June) 1956. 2. Over 200 laboratory and clinical papers from 14 countries.
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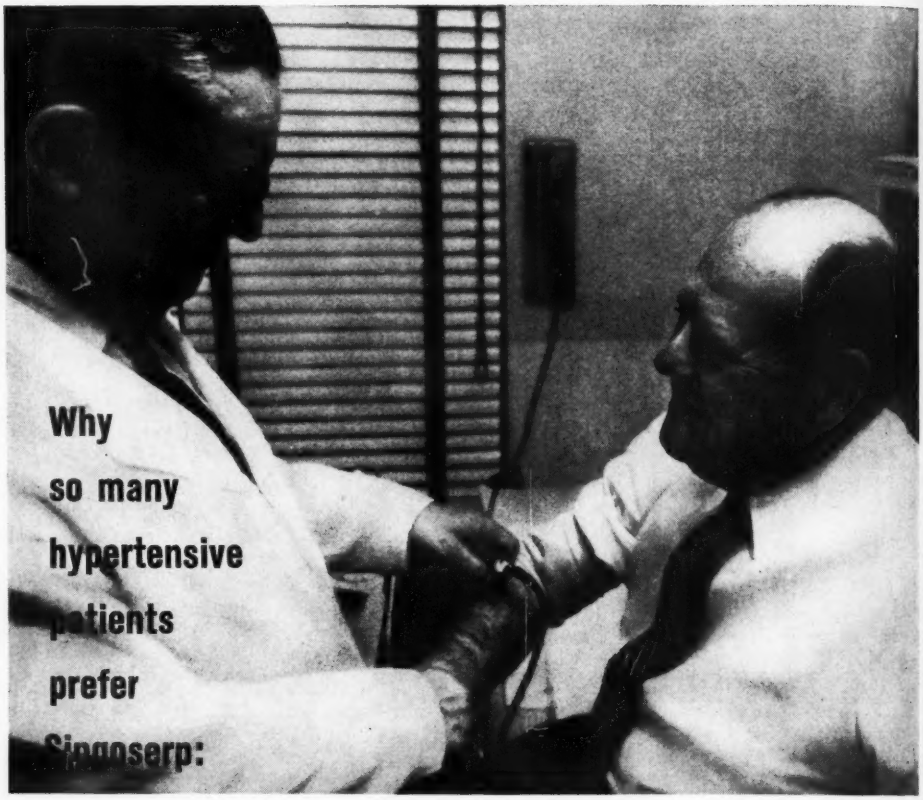

It spares them from the usual rauwolfia side effects

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*Herrmann, G. R., Vogelpohl, E. B., Hejtmancik, M. R., and Wright, J. C.: J.A.M.A. **169**:1609 (April 4) 1959.

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Overwhelming evidence[1-13] *proves:*

HIGH-DOSAGE NICOTINIC ACID EFFECTIVELY LOWERS CHOLESTEROL LEVELS

WITHOUT DIETARY RESTRICTIONS[1,2]

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capsules

In a recent report[1] on 44 patients, VASTRAN FORTÉ reduced plasma cholesterol levels to normal in 21 patients and lowered cholesterol levels by at least 40% in 14 more patients during a 30-week period. *There was no change in diet.*

VASTRAN FORTÉ produces no significant side effects on long-term administration. "No toxic reactions have been found by clinical and laboratory observations, including a battery of seven tests of hepatic function and needle biopsies of the liver in 17 patients after one year of therapy."[1] However, patients must be told to expect pronounced warm flushing within approximately 15 minutes of the early doses. This effect is the normal initial response to high-dosage nicotinic acid, and is in no way harmful. It generally does not occur after one or two weeks.

VASTRAN FORTÉ contains anticholesterol dosage of nicotinic acid[1-13] *fortified by added B-complex factors to guard against vitamin deficiencies due to large dosage of a single B factor;*[14-15] *plus pyridoxine to improve utilization of unsaturated fatty acids in normal diets*[16-17] *and ascorbic acid*[18] *for support against degenerative arterial changes.*

Each VASTRAN FORTÉ Capsule contains: nicotinic acid, 375.0 mg.; ascorbic acid, 50.0 mg.; riboflavin, 2.5 mg.; thiamine mononitrate, 5.0 mg.; pyridoxine hydrochloride, 0.5 mg.; calcium pantothenate, 2.5 mg.; cobalamin concentrate (vitamin B_{12} activity), 10.0 mcg. **Dosage:** Initial Dosage—2 capsules four times a day after meals for twelve weeks. Thereafter dosage should be adjusted according to response. Maintenance requirements may vary from 1 capsule q.i.d. to 4 capsules q.i.d. **Supply:** Bottles of 100.

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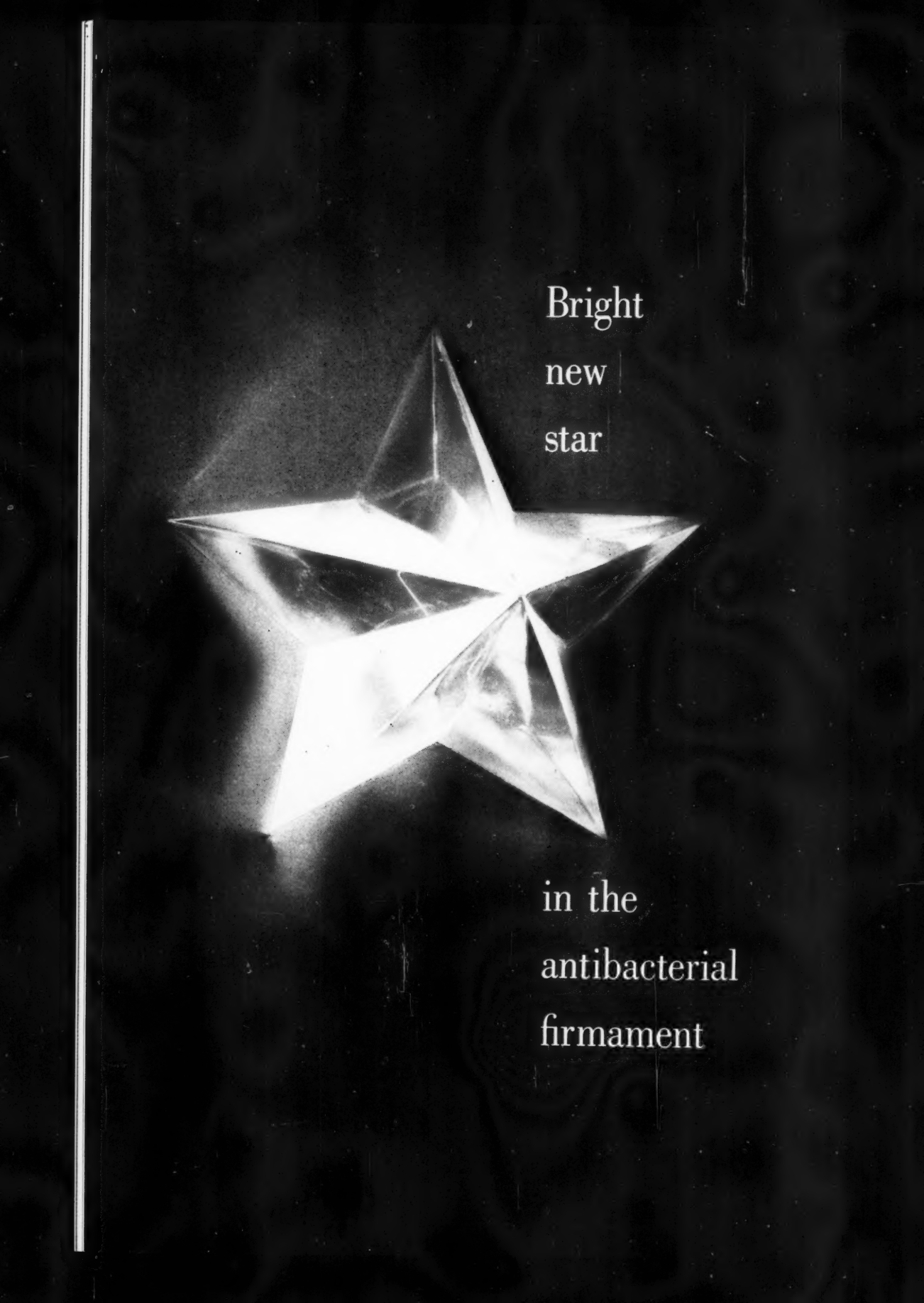
Bibliography: 1. Parsons, W. B., Jr., and Flinn, J. H.: A.M.A. Arch. Int. Med. *103*:783, 1959. 2. Parsons, W. B., Jr., and Flinn, J. H.: J.A.M.A. *165*:234 (Sept. 21) 1957. 3. O'Reilly, P. O.: Canad. M. A. J. *78*:402 (March 15) 1958. 4. Altschul, R., and Hoffer, A.: Arch. Biochem. *73*:420, 1958. 5. Achor, R. W. P.; Berge, K. G.; Barker, N. W., and McKenzie, R. F.: Circulation *17*:497, 1958 6. Altschul, R., and Hoffer, A.: Circulation *16*:499, 1957. 7. Hoffer, A., and Callbeck, M. J.: J. Ment. Sc. *103*:810, 1957. 8. Parsons, W. B., Jr., and Flinn, J. H.: Circulation *16*:499, 1957. 9. Achor, R. W. P.; Berge, K. G.; Barker, N. W., and McKenzie, B. F.: Circulation *16*:499, 1957. 10. O'Reilly, P. O.; Demay, M., and Kotlowski, K.: Arch. Int. Med. *100*:797, 1957. 11. deSoldati, L.; Stritzler, G., and Balassanian, S.: Prensa méd. argent. *44*:3286 (Nov. 8) 1957. 12. Parsons, W. B., Jr., *et al.*: Proc. Staff Meet. Mayo Clin. *31*:377 (June 27) 1956. 13. Altschul, R; Hoffer, A., and Stephen, J. D.: Arch. Biochem. *54*:588, 1955. 14. Seebrell, W H., and Harris, R. S.: The Vitamins; Chemistry, Physiology, Pathology, New York, Academic Press, 1954, vol. 2, p. 551. 15. Gregory, I.: J. Ment. Sc. *101*:85, 1955. 16. Sinclair, H. M.: Lancet *1*:381, 1956. 17. Page, I. H., *et al.*: J.A.M.A. *164*:2048 (Aug. 31) 1957. 18. Rosenfeld, L.: Am. J. Clin. Nutrition *5*:286, 1957.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Organism	*Sensitive*	*Resistant*	*% Sensitive*
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D. pneumoniae	14	0	*100.0*
Coliforms	34	3	*91.8*
Proteus	5	5	*50.0*
A. aerogenes	8	0	*100.0*
Ps. aeruginosa	5	4	*55.5*

*Includes many strains resistant to antibiotics.

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neither antibiotics nor sulfonamides

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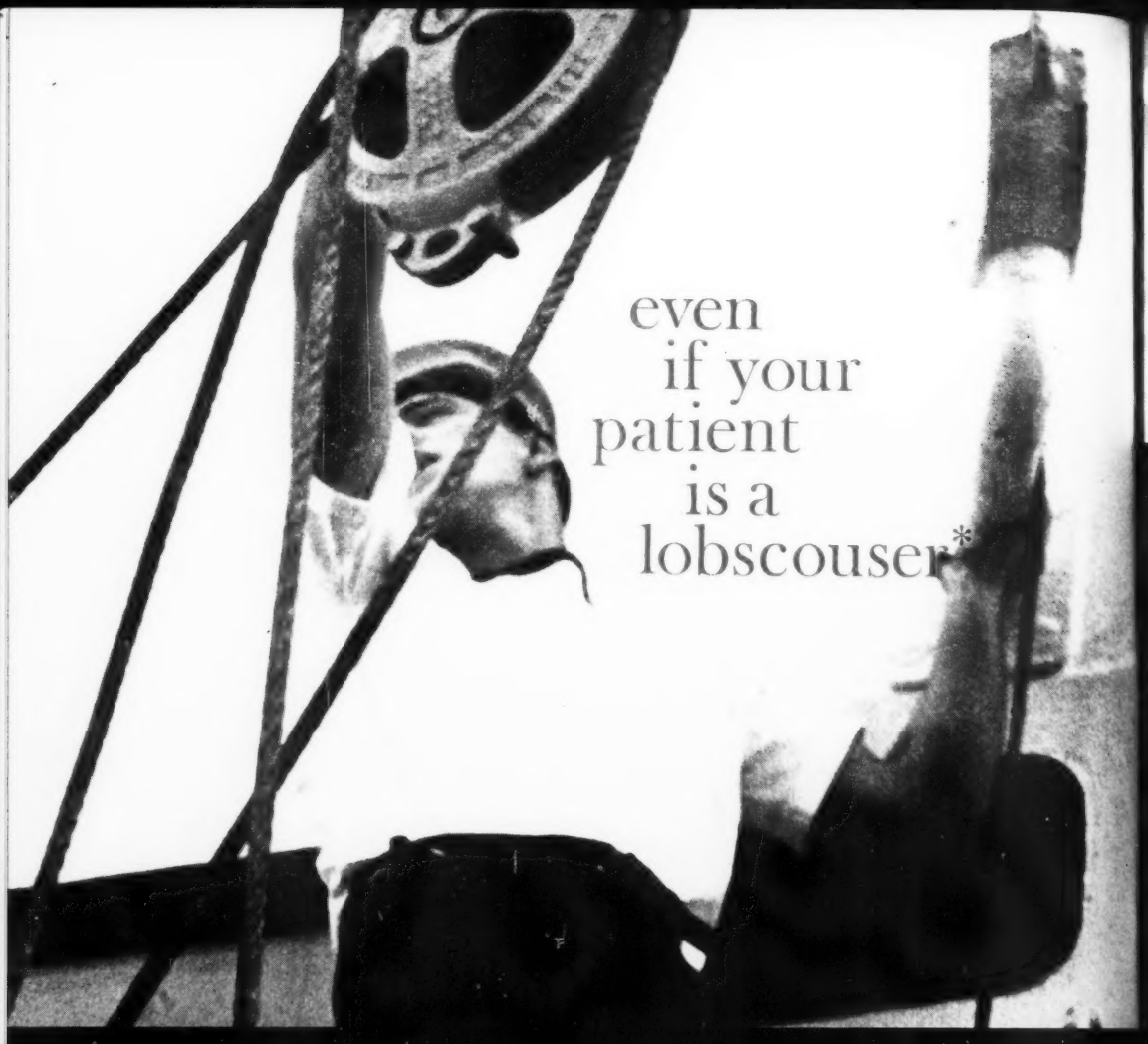

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prescribe PARAFON in low back pain—sprains—strains—rheumatic pains

Each PARAFON tablet contains:

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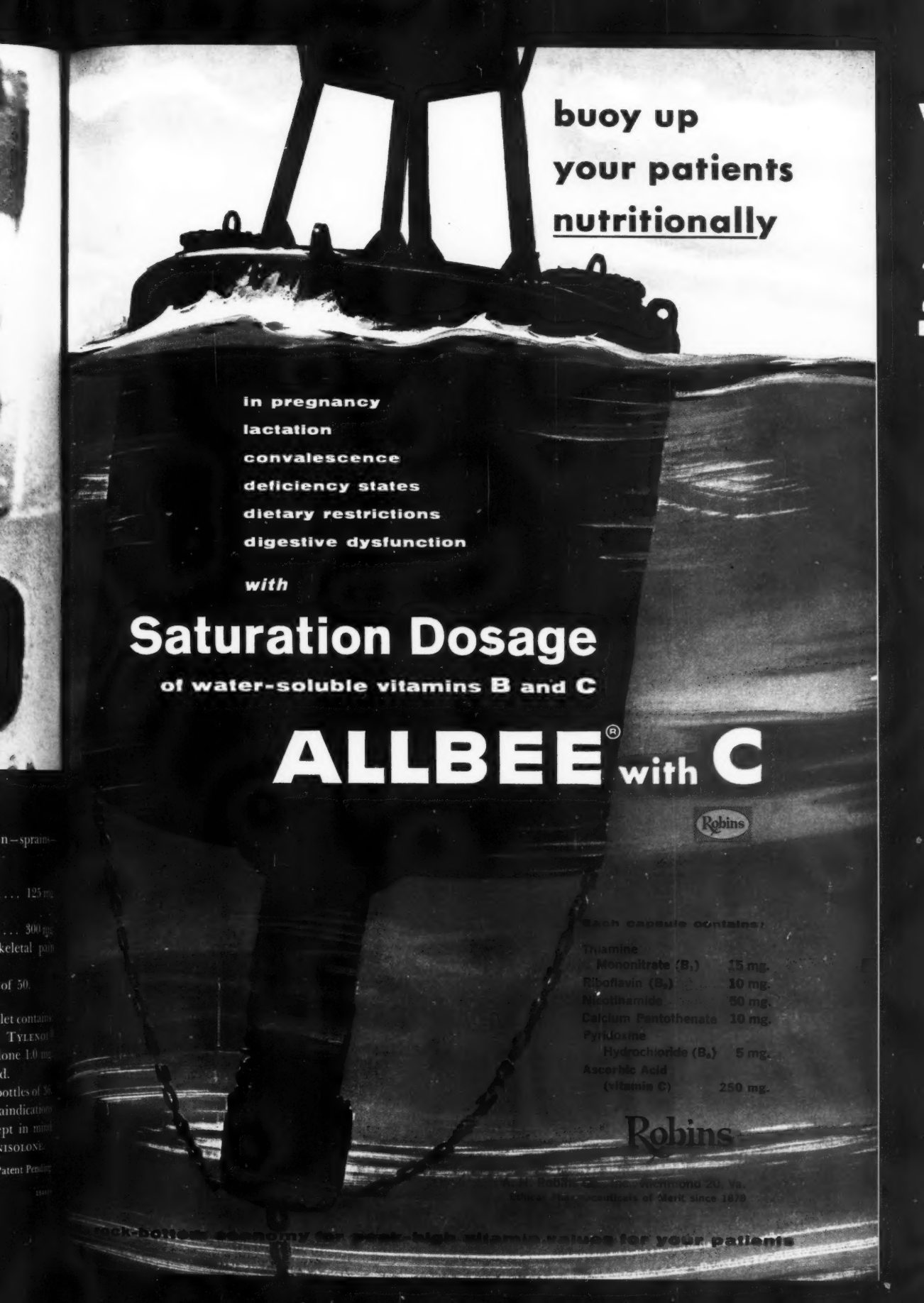
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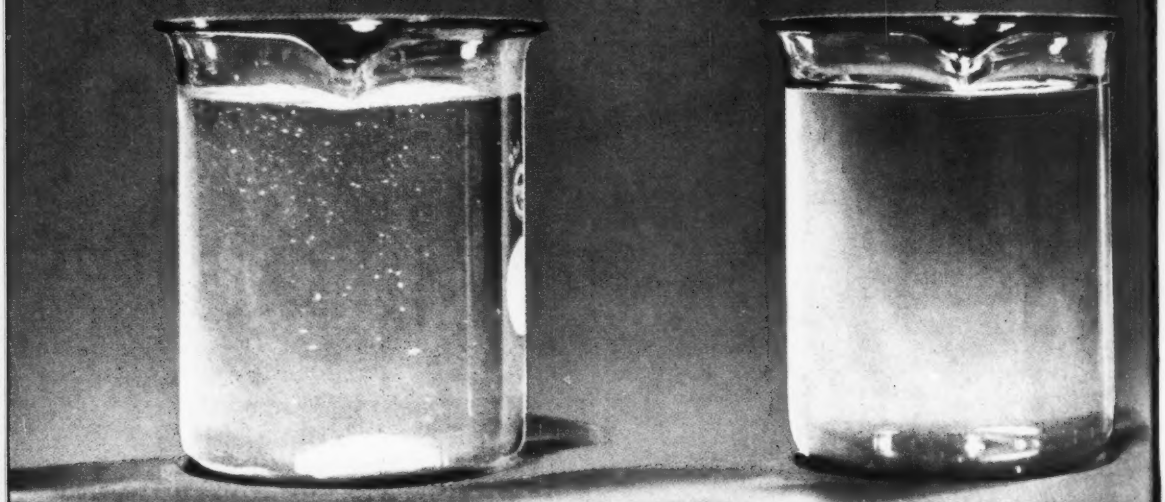
avoid the risk of insoluble, irritating aspirin particles

Chief among the drawbacks to aspirin usage is gastric intolerance. This ranges from mild upset and "heartburn" to severe hemorrhagic gastritis.[1-10] Studies performed in conjunction with gastrectomy[4-8] and gastroscopy[2] have shown insoluble aspirin particles firmly adherent to the gastric mucosa and imbedded between rugae. Reactions varying from mild hyperemia to erosive gastritis have been reported to occur in the areas immediately surrounding these adherent particles.[2,4-6] This is reported to be particularly true in patients with peptic ulcer.

CALURIN is the freely soluble, stable calcium aspirin complex
Its high solubility forestalls gastric irritation or damage

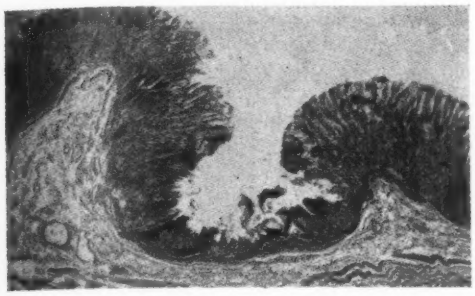


Regular aspirin crystals 24 hours after being mixed into water.

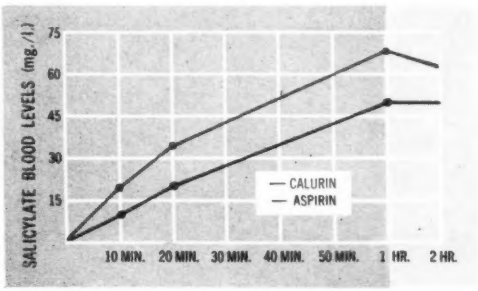
Calurin crystals in solution one minute after being mixed into water.

CALURIN*

STABLE SOLUBLE CALCIUM-ACETYLSALICYLATE-CARBAMIDE



Particle-induced ulceration — section through lesion found in gastrectomy specimen. An aspirin particle was found firmly imbedded in this undermined erosion. Such lesions may be associated with the relative insolubility of aspirin, which remains in particulate form after dispersion in gastric contents.



Calurin, being freely soluble, is promptly available for absorption into the systemic circulation. Salicylate blood levels in 12 subjects receiving both Calurin and plain aspirin were found to rise more than twice as high within ten minutes following Calurin. Also, these levels persisted higher for at least two hours.[11]

CALURIN is the aspirin of choice, especially when high-dosage, long-term therapy is indicated:

1. High solubility forestalls gastric irritation or damage. This advantage is of special importance in arthritis and other conditions requiring high-dosage, long-term therapy.
2. Produces high salicylate blood levels rapidly for prompt analgesic, anti-pyretic, anti-arthritic effect.
3. Sodium-free — for safer long-term therapy.
4. Flavored: can be chewed or dissolved in the mouth without water if desired — an advantage for patients requiring aspirin administration during the night and for pediatric patients.

Dosage: Each tablet of Calurin is equivalent to 300 mg. (5 gr.) of acetylsalicylic acid. For relief of pain and fever in adult patients, the usual dose of Calurin is 1 to 3 tablets every 4 hours, as needed; in arthritic states, 2 or 3 tablets 3 or 4 times daily; in rheumatic fever, 3 to 5 tablets 4 or 5 times daily. For children over 6 years, the usual dose is 1 tablet every 4 hours; for children 3 to 6 years, ½ tablet every 4 hours, as required. Not recommended for children under 3.

REFERENCES: 1. Waterson, A. P.: Aspirin and gastric haemorrhage, Brit. M. J. **2**:1531, 1955. 2. Douthwaite, A. H., and Lintott, G. A. M.: Gastroscopic observation of the effect of aspirin and certain other substances on the stomach, Lancet **2**:1222, 1938. 3. Editorial Comments: The effect of acetylsalicylic acid (aspirin) on the gastric mucosa, Canad. M. A. J. **80**:47, 1959. 4. Muir, A., and Cossar, I. A.: Aspirin and ulcer, Brit. M. J. **2**:7, 1955. 5. Muir, A., and Cossar, I. A.: Aspirin and gastric haemorrhage, Lancet **1**:539, 1959. 6. Schneider, E. M.: Aspirin as a gastric irritant, Gastroenterology **33**:616, 1957. 7. Bayles, T. B., and Tenckhoff, H.: Salicylate therapy in rheumatic diseases, Scientific Exhibit, Ann. Mtg. A. M. A., San Francisco, Calif., June, 1958. 8. Batterman, R. C.: Comparison of buffered and unbuffered acetylsalicylic acid, New Eng. J. M. **258**:213, 1958. 9. Cronk, G. A.: Laboratory and clinical studies with buffered and nonbuffered acetylsalicylic acid, New Eng. J. M. **258**:219, 1958. 10. Editorial: Aspirin plain and buffered, Brit. M. J. **1**:349, 1959. 11. Smith, P. K.: Plasma concentration of salicylate after the administration of acetylsalicylic acid or calcium acetylsalicylate to human subjects, Report submitted to Smith-Dorsey from Dept. of Pharmacology, Geo. Washington Univ. School of Medicine, Washington, D. C., Sept. 5, 1958.

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avoid the risk of insoluble, irritating aspirin particles

Regular aspirin crystals 24 hours after being mixed into water.

Calurin crystals in solution one minute after being mixed into water.

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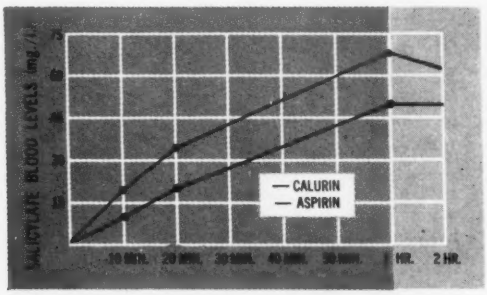
Particle-induced ulceration — section through lesion found in gastrectomy specimen. An aspirin particle was found firmly imbedded in this undermined erosion. Such lesions may be associated with the relative insolubility of aspirin, which remains in particulate form after dispersion in gastric contents.



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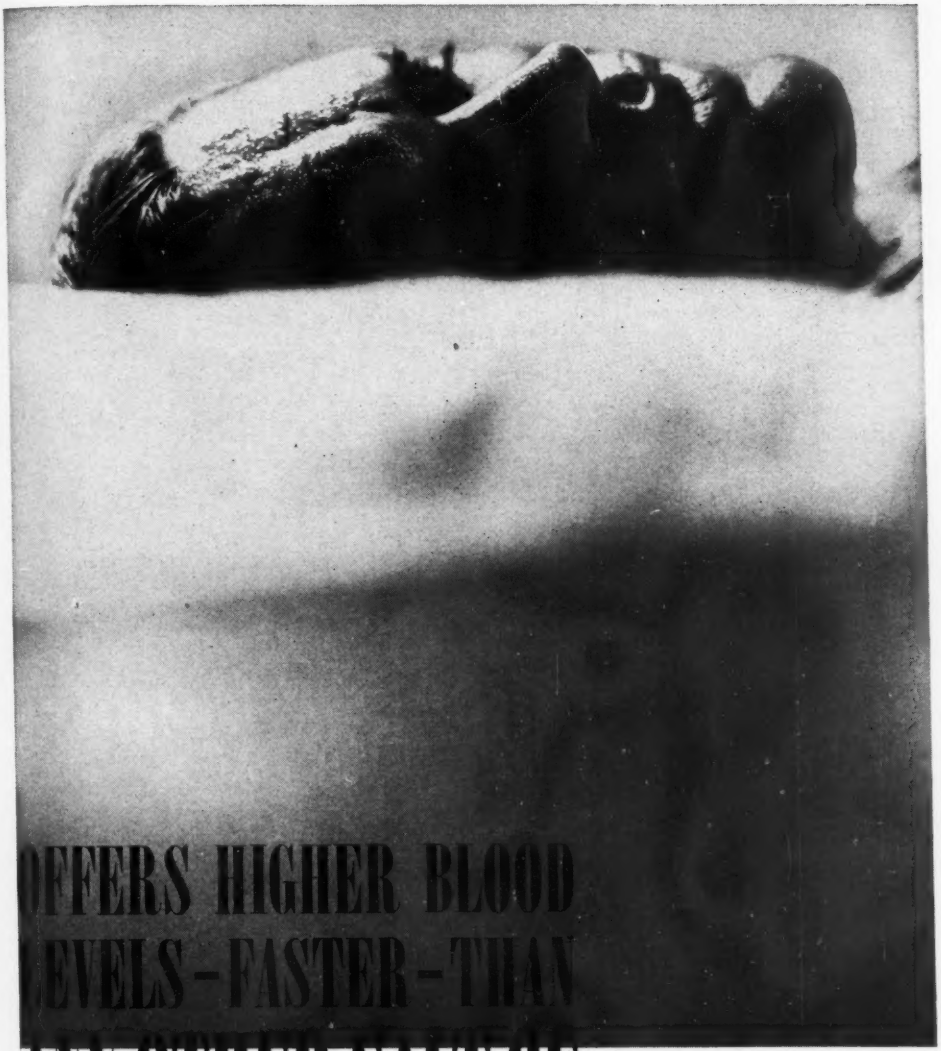

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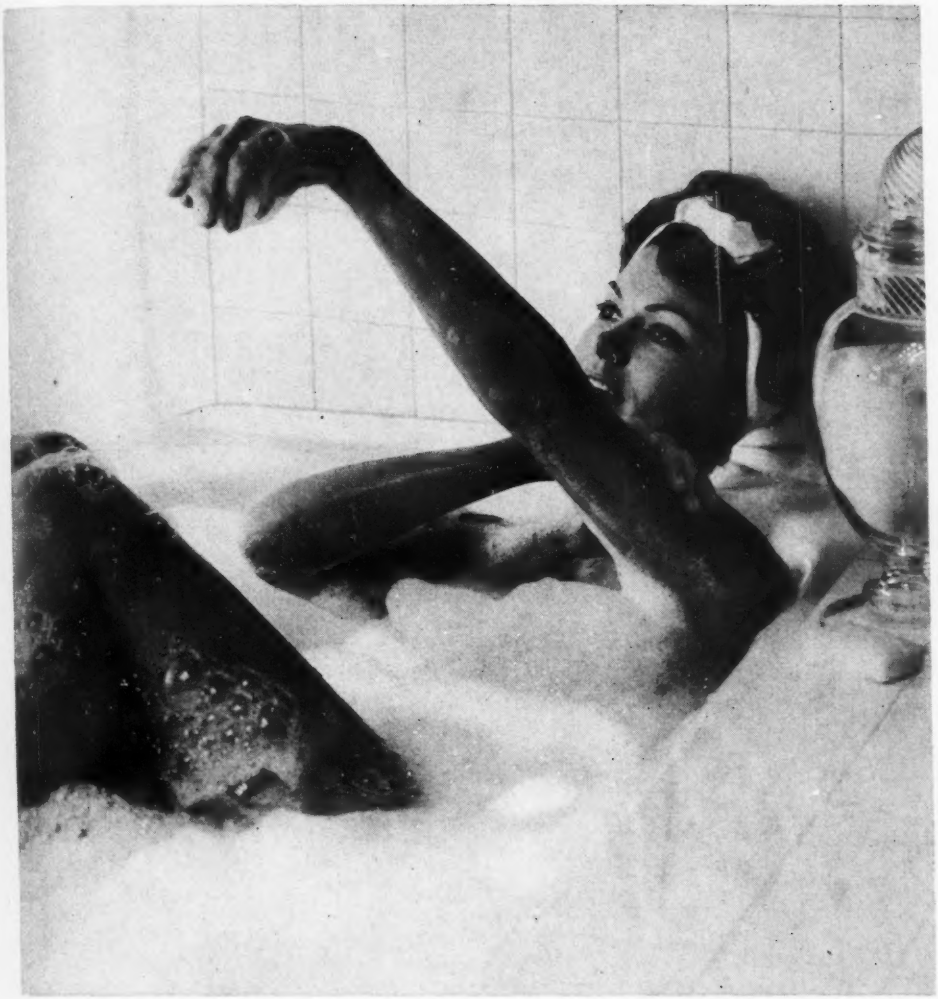
1. Goodman, L.S. and Gilman, A.: The Pharmacologic Basis of Therapeutics, MacMillan, 1955.



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2. Karnaky, K.J.: J.A.M.A. 157:1155, 1955 (August)
3. Scheinberg et al: Surgery 24:972, 1948 (Dec.).

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raspberry flavored, 10 cc. bottle (with calibrated dropper), 5 mg. per drop (100 mg. per cc.)

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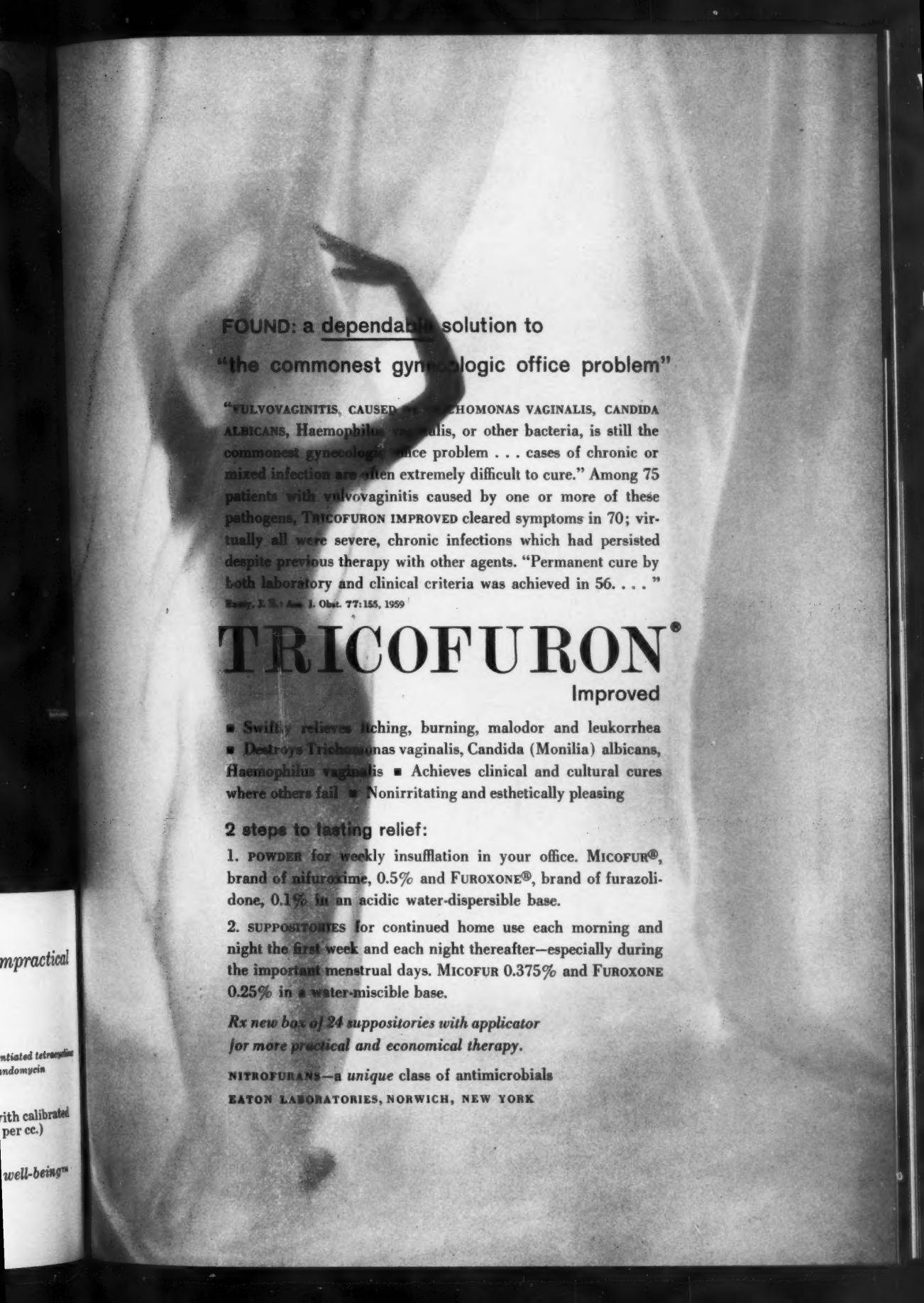

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NITROFURANS—a *unique* class of antimicrobials

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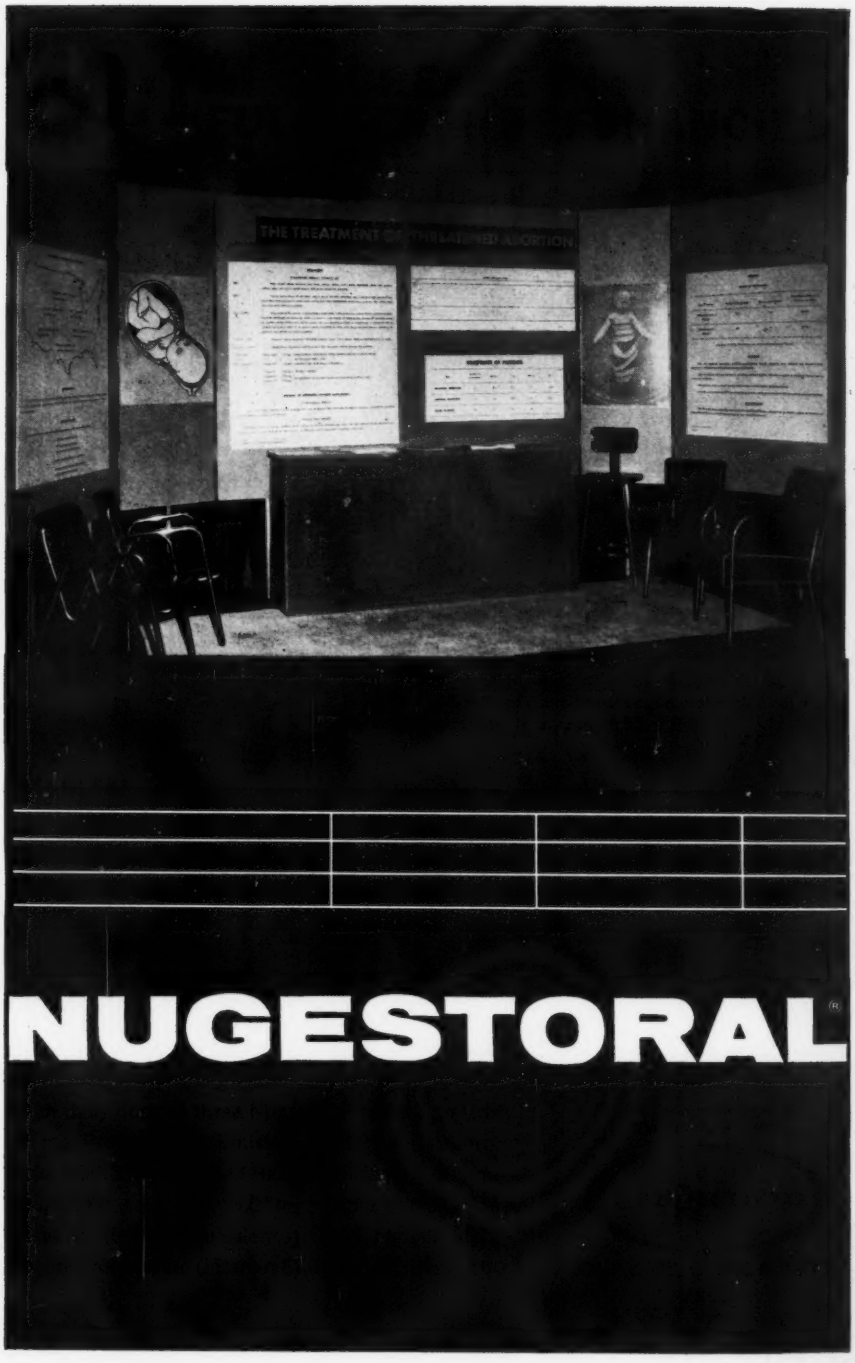
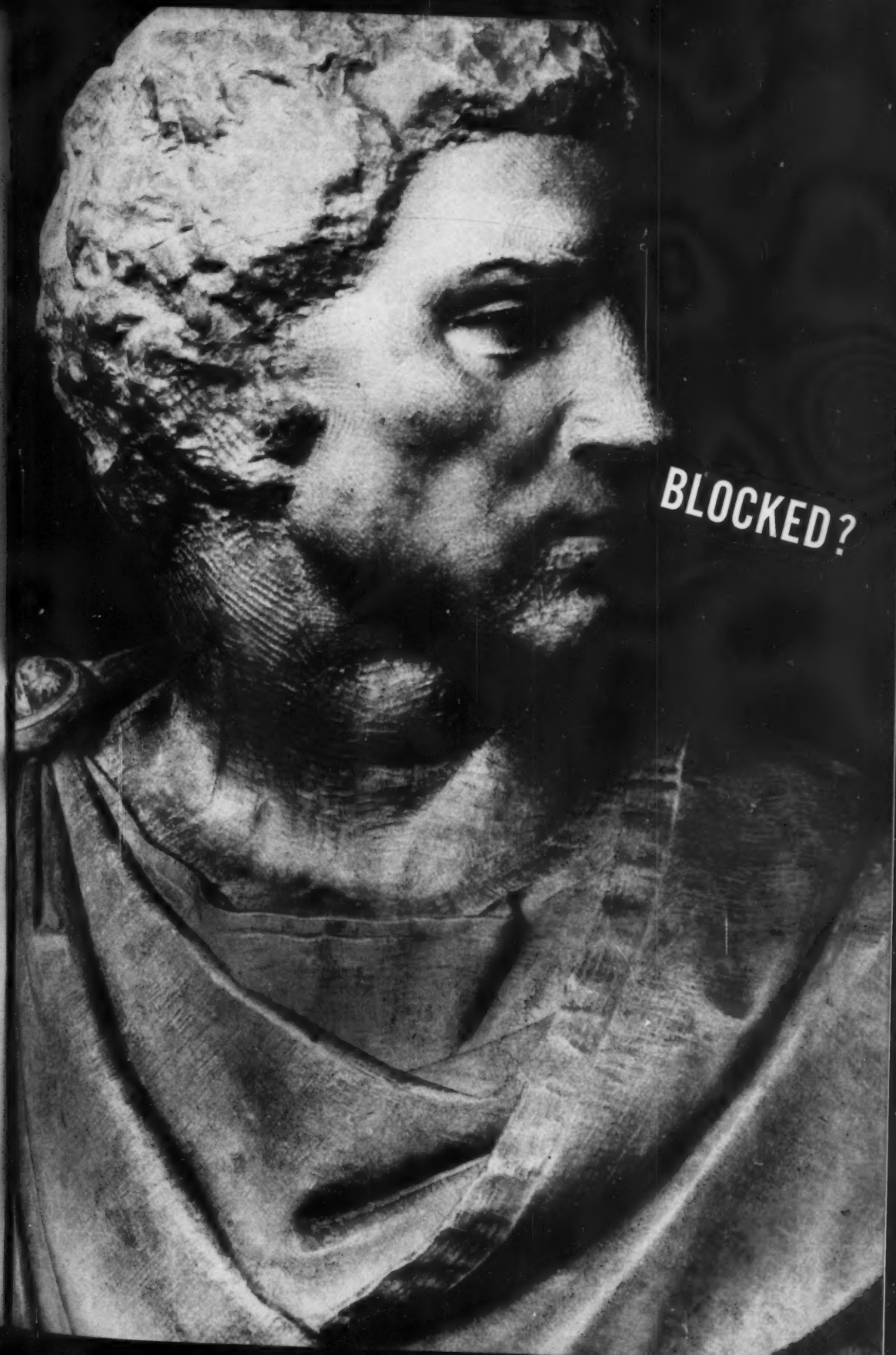
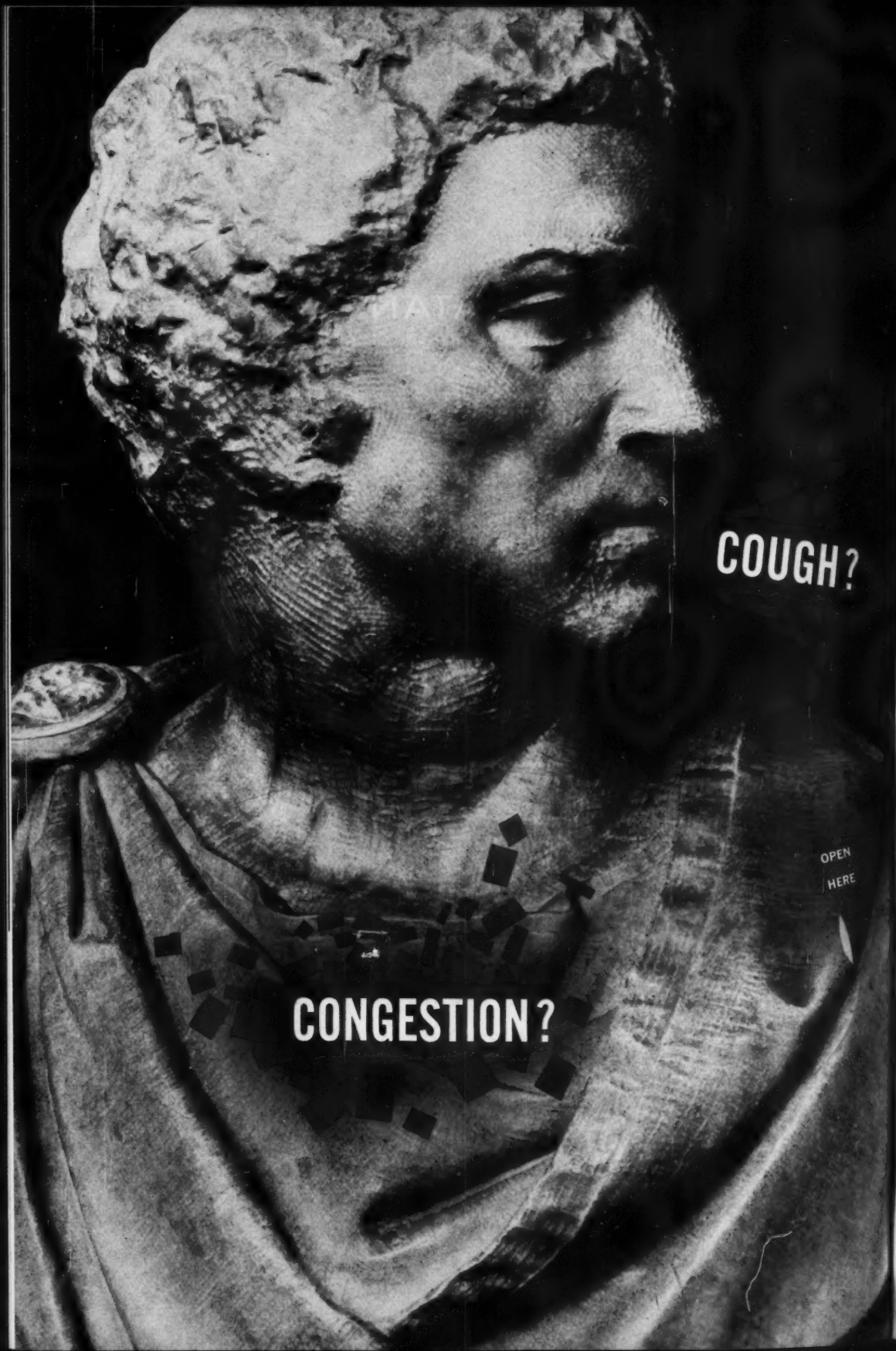

NUGESTORAL®


BLOCKED?


COUGH?
OPEN
HERE
CONGESTION?

H?

OPEN
HERE

in
peptic ulcer

Results with "... antacid therapy with DAA are essentially the same as ... with potent anticholinergic drugs."

Alglyn®

Dihydroxy aluminum aminoacetate, N.N.R.

In recent years, a number of new synthetic anticholinergic drugs with numerous and varying side effects have been investigated for treatment of peptic ulcer. However, a double-blind study conducted recently by Cayer et al suggests that the use of such anticholinergic drugs is seldom necessary. The authors concluded that "The percentage of 'good to excellent' results obtained in patients on continuous long-term antacid therapy with DAA (74%) is essentially the same as that previously noted in ulcer patients treated under similar conditions with potent anticholinergic drugs alone."

The authors' choice of dihydroxy aluminum aminoacetate (DAA) was based on the fact that "the tablet form of DAA (is) more active than a variety of straight aluminum hydroxide magmas." They further commented that "Because of the convenience of tablet medication as compared with the liquid gel—a convenience which in the use of other tablets is gained at the expense of therapeutic effectiveness—dihydroxy aluminum aminoacetate was used exclusively."

ALGLYN (dihydroxy aluminum aminoacetate) Tablets are supplied in bottles of 100 tablets (0.5 Gm. per tablet).

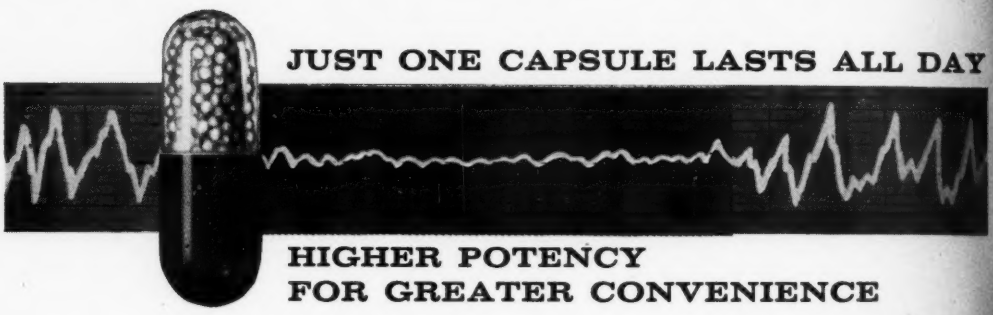
BRAYTEN PHARMACEUTICAL COMPANY • *Chattanooga 9, Tennessee*

NEW AND EXCLUSIVE

FOR SUSTAINED TRANQUILIZATION

MILTOWN® (*meprobamate*) now available in 400 mg. continuous release capsules as

Meprospan®-400



JUST ONE CAPSULE LASTS ALL DAY

HIGHER POTENCY FOR GREATER CONVENIENCE

- relieves *both* mental and muscular tension without causing depression
- does not impair mental efficiency, motor control, or normal behavior

Usual dosage: One capsule at breakfast, one capsule with evening meal

Available: *Meprospan-400*, each blue capsule contains 400 mg. Miltown (meprobamate)
Meprospan-200, each yellow capsule contains 200 mg. Miltown (meprobamate)
Both potencies in bottles of 30.

WALLACE LABORATORIES, *New Brunswick, N. J.*

CME-8426

For the first time

CONVENIENCE and ECONOMY

for that all-important first dose of broad-spectrum antibiotic therapy

New

TERRAMYCIN®

brand of oxytetracycline

INTRAMUSCULAR SOLUTION

Initiation of therapy in *minutes after diagnosis* with new, ready-to-inject Terramycin Intramuscular Solution provides maximum, sustained absorption of potent broad-spectrum activity.

...and for continued, compatible, coordinated therapy

COSA-TERRAMYCIN®

oxytetracycline with glucosamine

CAPSULES

Continuation with oral Cosa-Terramycin every six hours will provide highly effective antibacterial serum and tissue levels for prompt infection control.

The unsurpassed record of clinical effectiveness and safety established for Terramycin is your guide to successful antibiotic therapy.

Supply:

*Terramycin Intramuscular Solution**
100 mg./2 cc. ampules
250 mg./2 cc. ampules

Cosa-Terramycin Capsules
125 mg. and 250 mg.

Cosa-Terramycin is also available as:
Cosa-Terramycin Oral Suspension — peach flavored, 125 mg./5 cc., 2 oz. bottle
Cosa-Terramycin Pediatric Drops — peach flavored, 5 mg./drop (100 mg./cc.), 10 cc. bottle with plastic calibrated dropper

Complete information on Terramycin Intramuscular Solution and Cosa-Terramycin oral forms is available through your Pfizer Representative or the Medical Department, Pfizer Laboratories.

*Contains 2% Xylocaine® (lidocaine), trademark of Astra Pharmaceutical Products, Inc.

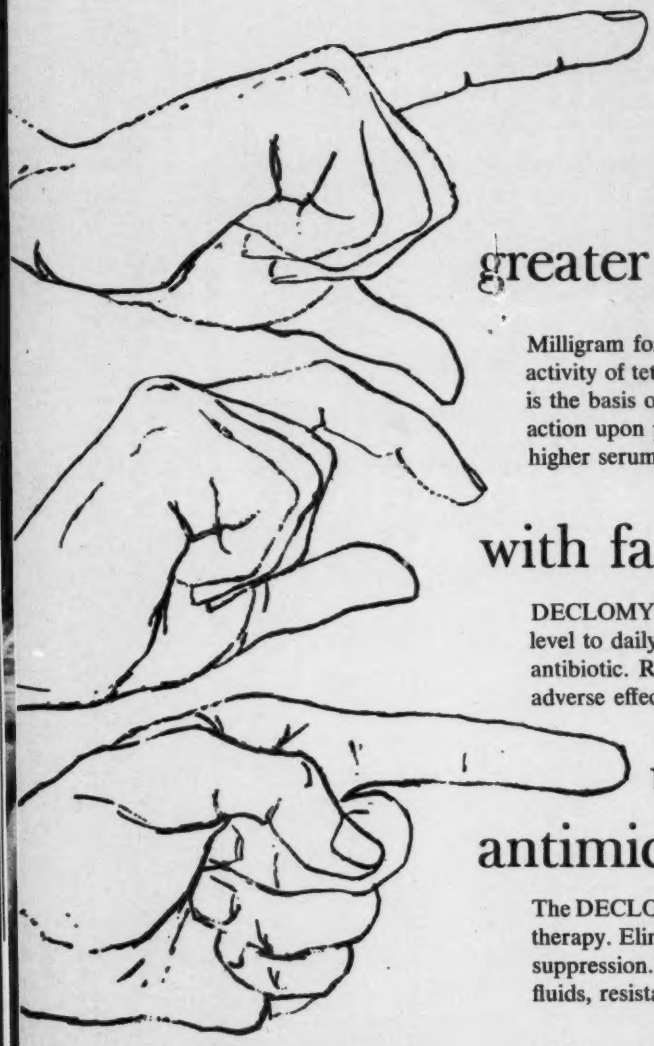
Pfizer

Science for the world's well-being™

PFIZER LABORATORIES, Division, Chas. Pfizer & Co., Inc., Brooklyn 6, N. Y.

LEDERLE INTRODUCES...

a masterpiece



greater antibiotic activity

Milligram for Milligram, DECLOMYCIN exhibits 2 to 4 times the activity of tetracycline against susceptible organisms. (*Activity* level is the basis of comparison—not quantitative blood levels—since action upon pathogens is the ultimate value.*) Provides significantly higher serum activity level...

with far less antibiotic intake

DECLOMYCIN demonstrates the highest ratio of prolonged activity level to daily milligram intake of any known broad-spectrum antibiotic. Reduction of antibiotic intake reduces likelihood of adverse effect on intestinal mucosa or interaction with contents.

unrelenting peak antimicrobial attack

The DECLOMYCIN high activity level is uniquely constant throughout therapy. Eliminates peak-and-valley fluctuation, favoring continuous suppression. Achieved through remarkably greater stability in body fluids, resistance to degradation and a low rate of renal clearance.

*Hirsch, H. A., and Finland, M. *New England J. Med.* 260:1 (May 20) 19

DECLO

Demethylchlortetracycline Lederle

ec of antibiotic design

plus
"extra-
day"
activity

FOR PROTECTION
AGAINST
RELAPSE

DECLOMYCIN maintains activity for one to two days after discontinuance of dosage. Features unusual security against resurgence of primary infection or secondary bacterial invasion—two factors often resembling a "resistance problem"—enhancing the traditional advantages of tetracycline . . . for greater physician-patient benefit

in the distinctive dry-filled, duotone capsule

immediately available as:
DECLOMYCIN Capsules, 150 mg., bottles of 16 and 100. Adult dosage: 1 capsule four times daily.

OMYCIN®

LEDERLE LABORATORIES
a Division of
AMERICAN CYANAMID COMPANY
Pearl River, New York

treats seborrheic dermatitis as an infectious process as well as a cosmetic problem

BETADINE™ SHAMPOO

(active ingredient: Povidone-Iodine)

established in 1905
TAILBY-NASON COMPANY, INC.
DOVER, DELAWARE

THE SEBORRHEIC STATE IS ALWAYS FOUND ASSOCIATED WITH BACTERIAL AND YEAST INFECTION. A TRUE ANTIDANDRUFF PREPARATION MUST BE CAPABLE OF DESTROYING THESE MICROORGANISMS.[1]

- kills pathogens on contact
- effective adjunctive therapy in severe pyoderma[2]
- safe, nontoxic, nonirritating, nonsensitizing
- rich golden lather, pleasantly scented, leaves hair easy-to-manage

1. Spaulding, E. H.: Chem. Germicidal Treatment of Pathogenic Microorganisms, ed. 2, New York, Grune & Stratton, Inc., 1959.
2. Frank, E.: J. Invest. Dermat. 32:59-62, 1959.

safety
efficacy
economy
rapidity
dependability
adaptability

Gantrisin... the quality of greatness

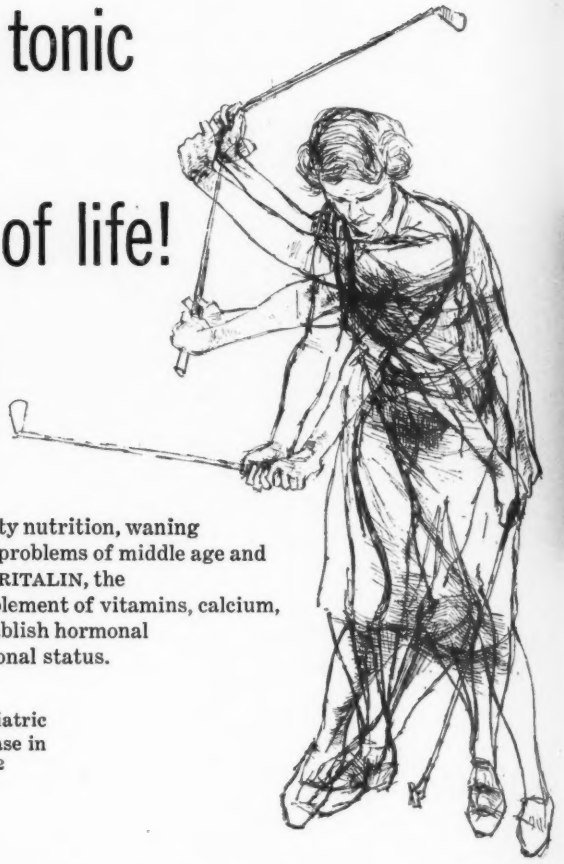
Reports in hundreds
of leading journals and
scores of standard textbooks
reflect the position of Gantrisin as drug
of choice in urinary and other bacterial infections.

ROCHE LABORATORIES

Division of Hoffmann-La Roche Inc • Nutley 10 • N. J.

GANTRISIN®—brand of sulfisoxazole ROCHE®

New revitalizing tonic brightens the second half of life!



Ritonic™

A sense of frustration and inadequacy, faulty nutrition, waning gonadal function—RITONIC meets all these problems of middle age and senile let-down. The unique combination of RITALIN, the *safe* central stimulant, with a balanced complement of vitamins, calcium, and hormones acts to renew vitality, re-establish hormonal and anabolic benefits, and improve nutritional status.

"We found Ritonic to be a safe, effective geriatric supplement..."[1] "Patients reported an increase in alertness, vitality and sense of well being."[2]

PRESCRIBE RITONIC

for your geriatric patients, your middle-aged patients and your postmenopausal patients.

Each Ritonic Capsule contains:

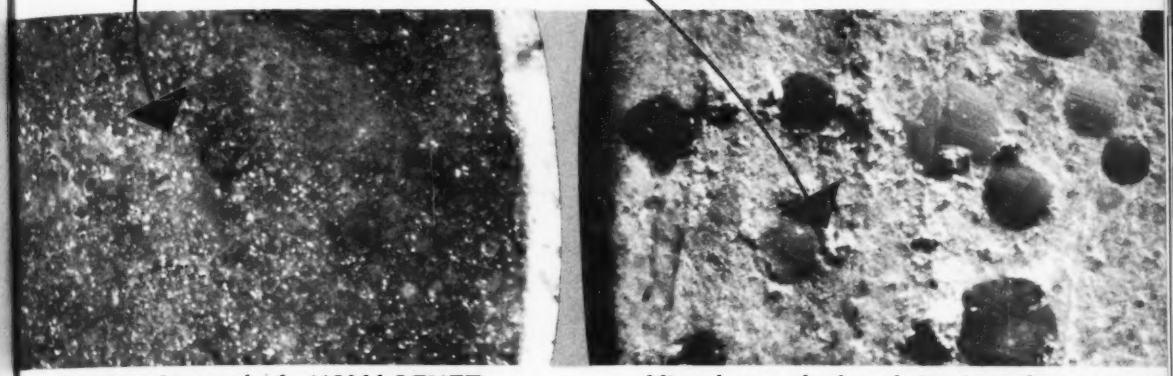
Ritalin® hydrochloride	5 mg.
methyltestosterone	1.25 mg.
ethinyl estradiol	5 micrograms
thiamin (vitamin B_1)	5 mg.
riboflavin (vitamin B_2)	1 mg.
pyridoxin (vitamin B_6)	2 mg.
vitamin B_{12} activity	2 micrograms
nicotinamide	25 mg.
dicalcium phosphate	250 mg.

Remember
SERPASIL®
(reserpine CIBA)
for the anxious hypertensive with or without tachycardia

Dosage: One Ritonic Capsule in mid-morning and one in mid-afternoon.
Supplied: Ritonic CAPSULES; bottles of 100.
References: 1. Natenshon, A. L.: J. Am. Geriatrics Soc. *6*:534 (July) 1958.
2. Bachrach, S.: To be published.
RITALIN® hydrochloride (methylphenidate hydrochloride CIBA)

CIBA SUMMIT, N. J.

HOMOGENIZATION makes the difference



Microphotograph of a **HOMAGENET**

Microphotograph of usual vitamin product

The photographs above point out the difference between Homagenets and many vitamin products. By means of the homogenization process, both oil and water soluble vitamins are presented in microscopic particles. Due to the fine particle size, there is much greater surface exposure, which permits quicker absorption and better utilization. This has been clinically proved by Lewis and others.[1]

1. Lewis, J.M., et al.: J. Pediatrics, *31*:496

HOMAGENETS®

The only homogenized vitamins in solid form

THE S.E. MASSENGILL COMPANY Bristol, Tennessee

Here
are the advantages
of

HOMAGENETS®*

the only
homogenized vitamins
in solid form

The advantages of HOMAGENETS

- Pleasant, candy-like flavor
- Better absorbed, better utilized
- Excess vitamin dosage unnecessary
- Longer storage in the body
- No "fishy burp"
- May be chewed, swallowed or dissolved in the mouth.

HOMAGENETS are available in five formulas:

PEDIATRIC—Children like the orange-flavored, candy-like taste.

PRENATAL—Contains iron and calcium as a dietary supplement during gestation.

GERIATRIC—A complete formula for the prevention of vitamin-mineral deficiencies.

AORAL—Useful in the treatment of certain types of skin disorders.

THERAPEUTIC—Particularly indicated during convalescence and stress periods.

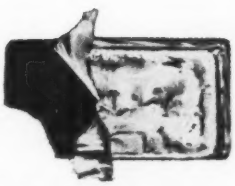
*U.S. Pat. 2676136. Other Pat. Pending

Currently, mailings will be forwarded only at your request. Write for samples and literature.

THE S.E. MASSENGILL COMPANY Bristol, Tennessee • New York • Kansas City • San Francisco

no more battles at vitamin time

Delectavites®



delectable, chewable, chocolate-like vitamin-mineral nuggets

No fights, no battles at vitamin time because children love to chew DELECTAVITES. These delectable, easily chewable chocolate nuggets supply all essential vitamins as well as minerals so necessary during the years of growth. As soon as children can chew, they can go directly from vitamin drops to DELECTAVITES. And, *now* you can be sure your little patients will follow your instructions about taking their daily vitamins.

Each nugget contains: Vitamin A—5000 Units* / Vitamin D—1000 Units*/ Vitamin C—75 mg. / Vitamin E—2 Units† Vitamin B_1—2.5 mg. / Vitamin B_2—2.5 mg. / Vitamin B_6—1 mg. / Vitamin B_{12} Activity—3 mcg. / Panthenol—5 mg. Nicotinamide—20 mg. / Folic Acid—0.1 mg. / Biotin—30 mcg. / Rutin—12 mg. / Calcium Carbonate—125 mg. / Boron—0.1 mg. / Cobalt—0.1 mg. / Fluorine—0.1 mg. / Iodine—0.2 mg. / Magnesium—3.0 mg. / Manganese—1.0 mg. / Molybdenum —1.0 mg. / Potassium—2.5 mg. *U.S.P. UNITS †INT. UNITS

dosage: one Delectavites daily. **supply:** Box of 30 (one month's supply), Box of 90 (three months' supply).

WHITE LABORATORIES, INC., KENILWORTH, NEW JERSEY

how often have you thought...

"...but how will it work in my practice?"

This most frequently asked question cannot be answered by the manufacturer, the detail man, an advertisement, a piece of mail. Only through actual experience with a product in day-to-day private practice can this question be answered.

UNITENSEN PROVED IN DAY-TO-DAY PRACTICE In office trials, Unitensen products have been proved effective therapy in the management of the hypertensive patient. These are the facts, obtained from 3,841 physicians, who used Unitensen products in their day-to-day office practice, in treating a total of 35,727 patients. In 11,093 cases (31.0%) results were "excellent"; in 51.2% (18,294) cases, "good"; "fair" results were obtained in 4,591 patients (12.9%) and in only 1,749 cases (4.9%) were results "unsatisfactory." Minor side effects were reported in 1,081 cases (3.0%).

The results mentioned above were obtained while the patients engaged in their normal daily occupations and activities. None of the patients involved in the study were hospitalized or institutionalized. And, despite such variables as dietary indiscretions, an occasional overdose, or a dose inadvertently "missed," the Proof In Practice Study shows Unitensen products to be safe, dependable, potent antihypertensive therapy . . . permitting practical office management of virtually all hypertensive cases.

UNITENSEN: BASIC HYPERTENSIVE THERAPY Although many of the patients in the Study also received diuretics and/or tranquilizers during the course of treatment, it was noted that the vasodilating effect of Unitensen was required to obtain optimum blood pressure control. Unitensen, a true hypotensive agent, is potentiated by diuretics. A combination of the two is frequently recommended for lower dosage of each drug, minimizing the side effects of either.

UNITENSEN DOES MORE THAN LOWER BLOOD PRESSURE Dr. Burton M. Cohen* makes the following observations regarding Unitensen:

"Hypotensive effect obtained through specific stimulation of afferent side of reflex pathways of blood pressure control without adrenolytic action or ganglionic blocking . . . Nausea and vomiting rare . . . No alteration of vasomotor reflexes, thus no postural collapse . . . Bradycardia, never tachycardia, may occur . . . Cardiac output not lessened . . . Renal circulation participates in reflex vasodilation . . . Cerebrovascular resistance is decreased, with improvement or maintenance of blood flow and O_2 utilization . . . No dangerous side actions have been reported."*

UNITENSEN-R® Each tablet contains cryptenamine (tannates) 1.0 mg., reserpine, 0.1 mg.

UNITENSEN-PHEN® Each tablet contains cryptenamine (tannates) 1.0 mg., phenobarbital, 15 mg.

UNITENSEN® Each tablet contains cryptenamine (tannates) 2.0 mg.

Clinical supplies available on request.

Neisler IRWIN, NEISLER & CO. • Decatur, Illinois

*Cohen, B. M.: The Ambulatory Patient with Hypertension: An Approach to Office Management, presented at the American Medical Association Convention, San Francisco, California, June 22-27, 1958.

BIBLIOGRAPHY

1. J. Pharm. & Exp. Ther. 89:131
2. J. Urology 73:487
3. J. Mo. Med. Assoc. 48:685
4. Med. Rec. & Annals 43:1104

IN G. I. OR G. U. SPASM

Thioethylamine (-$SCH_2CH_2N<$), nucleus of the Trocinate molecule, is common to enzymes involved in the contraction of smooth muscle cells. Sulfur, the key atom of the thioethylamine group, is also basic to the chemistry of muscle contractions, entering into the essential reversible oxidation-reduction reactions. These identities suggest that the strong, direct inhibiting action of Trocinate upon muscle-cell contraction, independent of general suppression of the parasympathetic nervous system, is that of a true anti-metabolite. Skeletal muscles are not affected.

Comprehensively evaluated pharmacologically[1] and clinically[2,3,4], Trocinate is a potent and dependable antispasmodic, yet is remarkably free from side-effects, and will not cause mydriasis, anuria, or tachycardia. Its antisialogogue effect is extremely low.

Dosage: **The basic adult dosage is two Trocinate tablets, three or four times daily, but dosage may be safely increased in severe spasm.**

Wm. P. Poythress *& Co., Inc.*

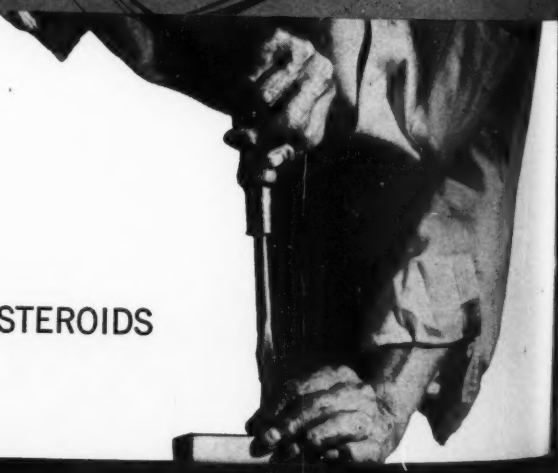
RICHMOND 17, VIRGINIA

WITHOUT STEROIDS

In every arthritic state

WITHOUT STEROIDS

WITHOUT STEROIDS



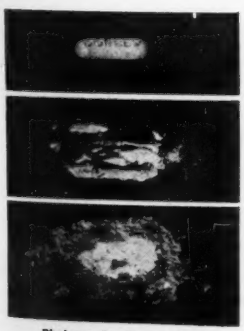
state MAINTENANCE THERAPY WITHOUT STEROIDS IS FUNDAMENTAL

Sound, conservative therapy with salicylates has been consistently reaffirmed as basic, long-term maintenance therapy in the arthritides.

Buffered Pabirin provides superior maintenance therapy. It epitomizes fundamental long-term basic therapy since it can be given month after month without serious complications and with minimal problems to patient and doctor alike.

Buffered Pabirin is formulated to provide high and sustained salicylate blood levels. Each tablet consists of an outer layer containing a buffer (aluminum hydroxide), para-aminobenzoic acid, and ascorbic acid; a core of acetylsalicylic acid.

In the stomach, the outer layer quickly releases the buffer, which protects against nausea, dyspepsia and other gastrointestinal symptoms so frequently encountered with salicylates alone. The core of Buffered Pabirin then disintegrates rapidly, permitting rapid absorption of the acetylsalicylic acid for faster pain relief.



Photographs show 2-stage Tandem Release disintegration.

Each tablet contains:

Acetylsalicylic acid (5 gr.)	300 mg.
Para-aminobenzoic acid (5 gr.)	300 mg.
Ascorbic acid	50 mg.
Dried aluminum hydroxide gel	100 mg.

All Buffered Pabirin is sodium- and potassium-free.

Dosage: Two or three tablets 3 or 4 times daily.

References: 1. Hart, D.; Bagnall, A. W.; Bunim, J. J., and Polley, F. H.: Ninth International Congress on Rheumatic Diseases, Toronto, Ont. (June 25) 1957. 2. Report of Joint Committee, Medical Research Council & Nuffield Foundation, Treatment of Rheumatoid Arthritis, British Medical Journal (April 13) 1957. 3. Friend, D. G.: New England J. Med. 257:278 (Aug.) 1957.

Buffered **Pabirin®** *Tablets*

SMITH-DORSEY · a division of The Wander Company · Lincoln, Nebraska · Peterborough, Canada

Al-Caroid®

controls the double trouble...

1. hyperacidity relieved – In AL-CAROID, selected antacids act promptly to relieve heartburn, flatulence and other distressing symptoms of gastric hyperacidity.

2. digestion maintained – AL-CAROID contains the proteolytic enzyme – Caroid® – which is not inactivated by antacids, thus assuring maintenance of protein digestion.

Powder/Tablets *Write for samples*

American Ferment Co., Inc. • 1450 Broadway • New York 18, N. Y.

before, during, and after childbirth

VISTARIL® hydroxyzine pamoate ...*eases mental and physical discomfort*

When you give her VISTARIL, confidence replaces anxiety—but not to the point of euphoria. The effectiveness of VISTARIL in pre and postpartum nausea and vomiting adds greatly to the patient's comfort. VISTARIL enhances the action of opiates, thus decreasing narcotic requirements and lessening the possibility of respiratory depression and reduced circulatory and cortical function.

Supply: Capsules, 25 mg., 50 mg. and 100 mg.; Oral Suspension, 25 mg. per 5 cc. teaspoonful; Parenteral Solution, 10 cc. vials and 2 cc. Steraject® Cartridges—25 mg. hydroxyzine HCl per cc.

A Professional Information Booklet containing further information is available from the Medical Department on request.

Pfizer™ *Science for the world's well-being*

PFIZER LABORATORIES, Div., Chas. Pfizer & Co., Inc., Brooklyn 6, N. Y.

Incremin®

Lysine-Vitamins Lederle

with iron Syrup
for the
undersized
underweight child

build appetite
with
B complex
vitamins

prevent
nutritional
anemia
with ferric pyrophosphate,
a form of iron
exceptionally
well-tolerated

in taste-tempting cherry flavor

Average dosage, 1 teaspoonful (5 cc.) contains:

l-Lysine HCl	300 mg.
Vitamin B_{12} Crystalline	25 mcgm.
Thiamine (HCl B_1)	10 mg.
Pyridoxine HCl (B_6)	5 mg.
Ferric Pyrophosphate (Soluble)	250 mg.
Iron (as Ferric Pyrophosphate)	30 mg.
Sorbitol	3.5 Gm.
Alcohol	0.75%

Bottles of 4 and 16 fl. oz.

promote
protein uptake
with the
potentiating effect
of l-Lysine on
low-grade
protein foods

Lederle LEDERLE LABORATORIES, a Division of AMERICAN CYANAMID COMPANY, Pearl River, New York

NIATRIC™

TABLETS AND ELIXIR

To add life to years—not merely years to life . . . Niatric sharpens mental acuity and promotes a return to more normal social and physical activity for your aged patients.

In the Old Age Syndrome . . . Niatric relieves confusion, forgetfulness, irritability, depression and apathy—the penalties of advancing age.

- **Niatric improves respiration and cerebral function**
- **Niatric improves circulation**
- **Niatric protects capillary integrity**
- **Niatric prevents brain tissue hypoxia**

Niatric contains:	Each Tablet:	5 cc. Elixir:
Pentylenetetrazol	100 mg.	100 mg.
Nicotinic Acid	50 mg.	50 mg.
Ascorbic Acid	100 mg.	100 mg.
Bioflavonoids	100 mg.	-----
Alcohol	-----	15%

Average Dose: 1 tablet or 1 tsp. (5 cc.) t.i.d.
Supply: Tablets, bottles of 100 and 500. Elixir, bottles of 1 pint.

Send now for samples and literature . . .

B. F. ASCHER AND COMPANY, INC.
Ethical Medicinals / Kansas City, Missouri

NIAMID*

REDUCES PAIN IN ANGINA PECTORIS

NIAMID, in clinical tests, proved to have a high degree of safety and to be a valuable adjunct in the management of the anginal syndrome. NIAMID produces symptomatic improvement in angina patients...

- reduces frequency of anginal episodes
- diminishes severity of attacks
- decreases nitroglycerin requirements
- renews sense of well-being

DOSAGE: Start with 75 mg. of NIAMID daily in single or divided doses. After a week or more, adjust the dosage, depending on patient response, in steps of one or one-half 25 mg. tablet. Once improvement is seen, gradually reduce dosage to the maintenance level. Many patients respond to NIAMID within a few days, others within 7 to 14 days.

PRECAUTIONS: Side effects are infrequent and mild, and often lessened or eliminated by a reduction in dosage. Hypotensive effects have rarely been noted and no jaundice or other evidence of liver damage has been reported in patients receiving NIAMID. However, in patients with a history of liver disease, the possibility of hepatic reactions should be kept in mind. Despite dramatic relief of symptoms and increased sense of well-being in anginal cases, it is advisable to caution the patient against overexertion.

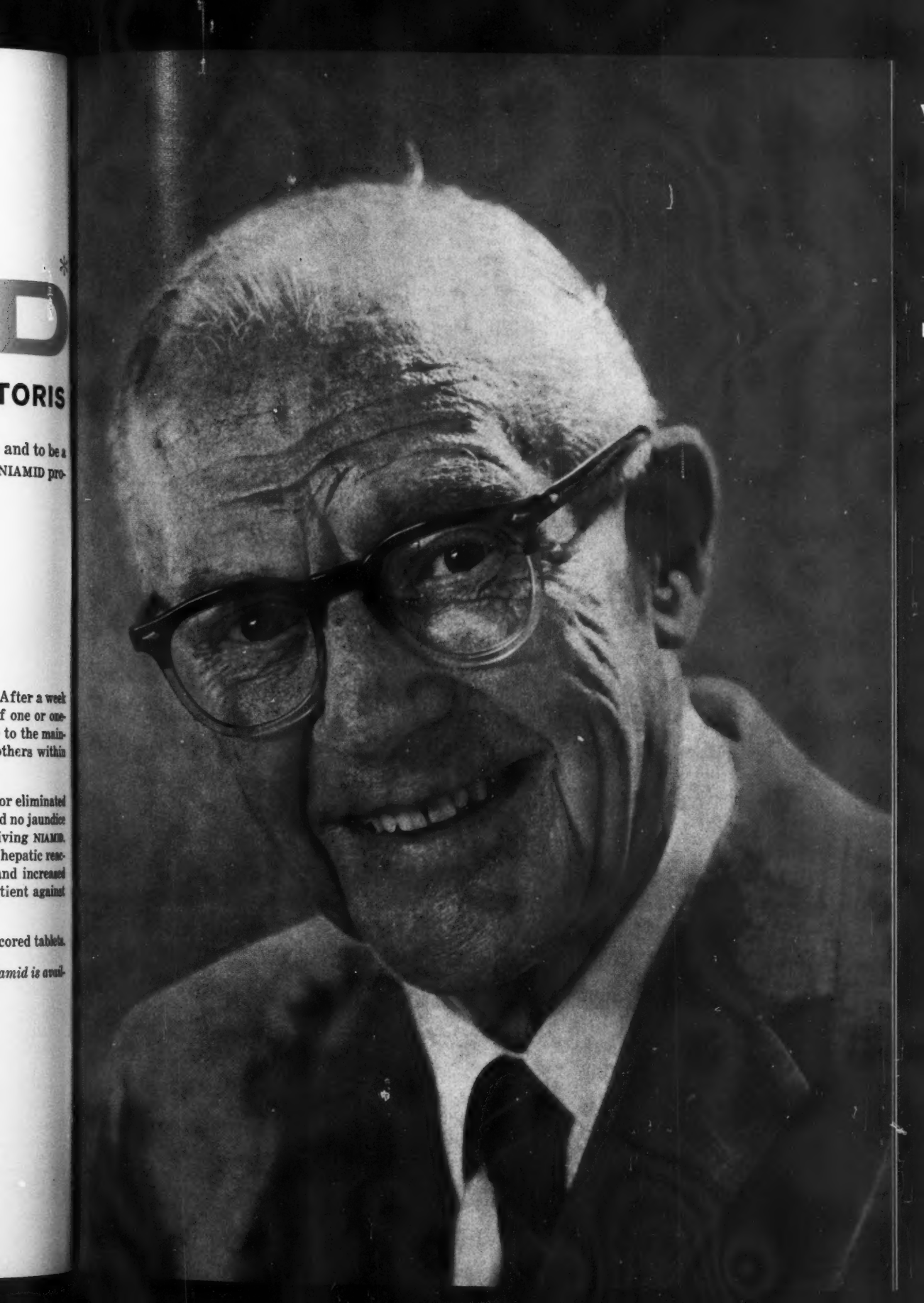
SUPPLY: NIAMID is available in 25 mg. (pink) and 100 mg. (orange) scored tablets.

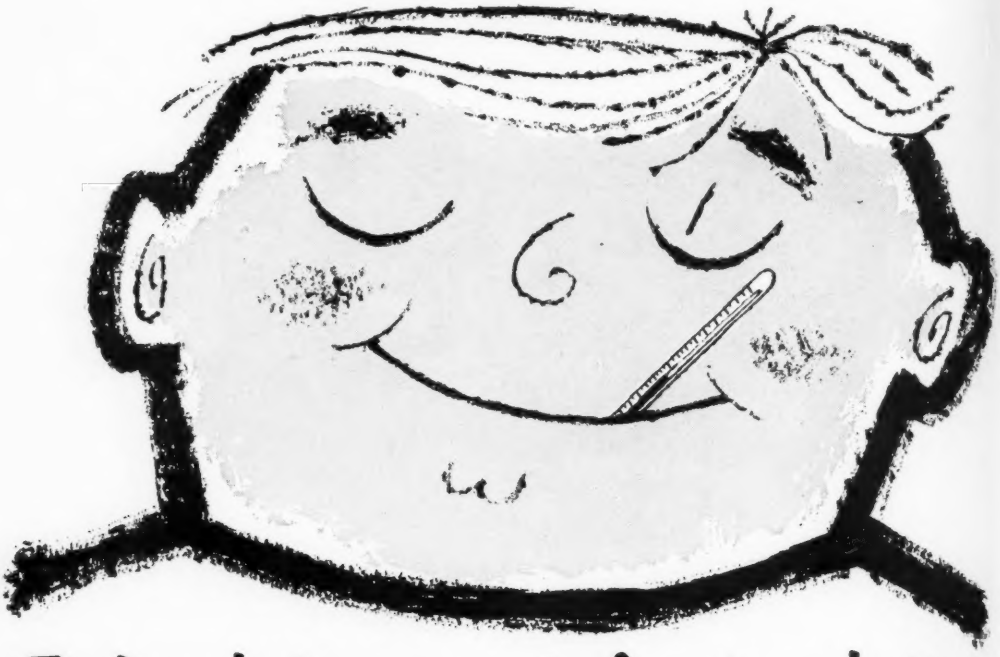
A Professional Information Booklet giving detailed information on Niamid is available on request.

*Trademark for brand of nialamide

Pfizer *Science for the world's well-being*

PFIZER LABORATORIES, Division, Chas. Pfizer & Co., Inc., Brooklyn 6, N. Y.





Feeling better is part of getting better

Hasamal

to relieve the discomforts of upper respiratory infections

Each HASAMAL tablet contains:

Phenobarbital..... 16.2 mg. (¼ gr.)
Acetylsalicylic Acid..... 162.5 mg. (2½ gr.)
Acetophenetidin..... 162.5 mg. (2½ gr.)
Hyoscyamus Alkaloids..... 0.0337 mg.
(Equiv. to ¼ gr. Ext. Hyoscyamus)

Dose: One or 2 tablets, repeated as necessary.

The HASKELL family of graduated analgesics... select the analgesic according to the degree of pain:

HASAMAL—Formula above

HASACODE—Hasamal formula with ¼ gr. Codeine Phosphate

HASACODE "STRONG"—Hasamal formula with ½ gr. Codeine Phosphate

- **relieve pain and tensions**
- **reduce fever**
- **stop excessive nasal secretions**
- **without unwanted diaphoresis***

(especially important for ambulant patients)

*original Haskell formulation

CHARLES C. HASKELL *& COMPANY, Richmond, Virginia*

running noses

and open stuffed noses orally

Triaminic®

the leading oral nasal decongestant

- in nasal and paranasal congestion
- in sinusitis
- in postnasal drip
- in allergic reactions of the upper respiratory tract

safer and more effective than topical medication[1,2,3]

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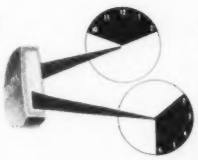

first — the outer layer dissolves within minutes to produce 3 to 4 hours of relief

then — the core disintegrates to give 3 to 4 *more* hours of relief

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Dosage: One tablet in the morning, mid-afternoon and at bedtime.

References: 1. Lhotka, F. M.: Illinois M. J. 112: 259 (Dec.) 1957. 2. Fabricant, N. D.: E.E.N.T. Monthly 37:460 (July) 1958. 3. Farmer, D. F.: Clin. Med. 5:1183 (Sept.) 1958.

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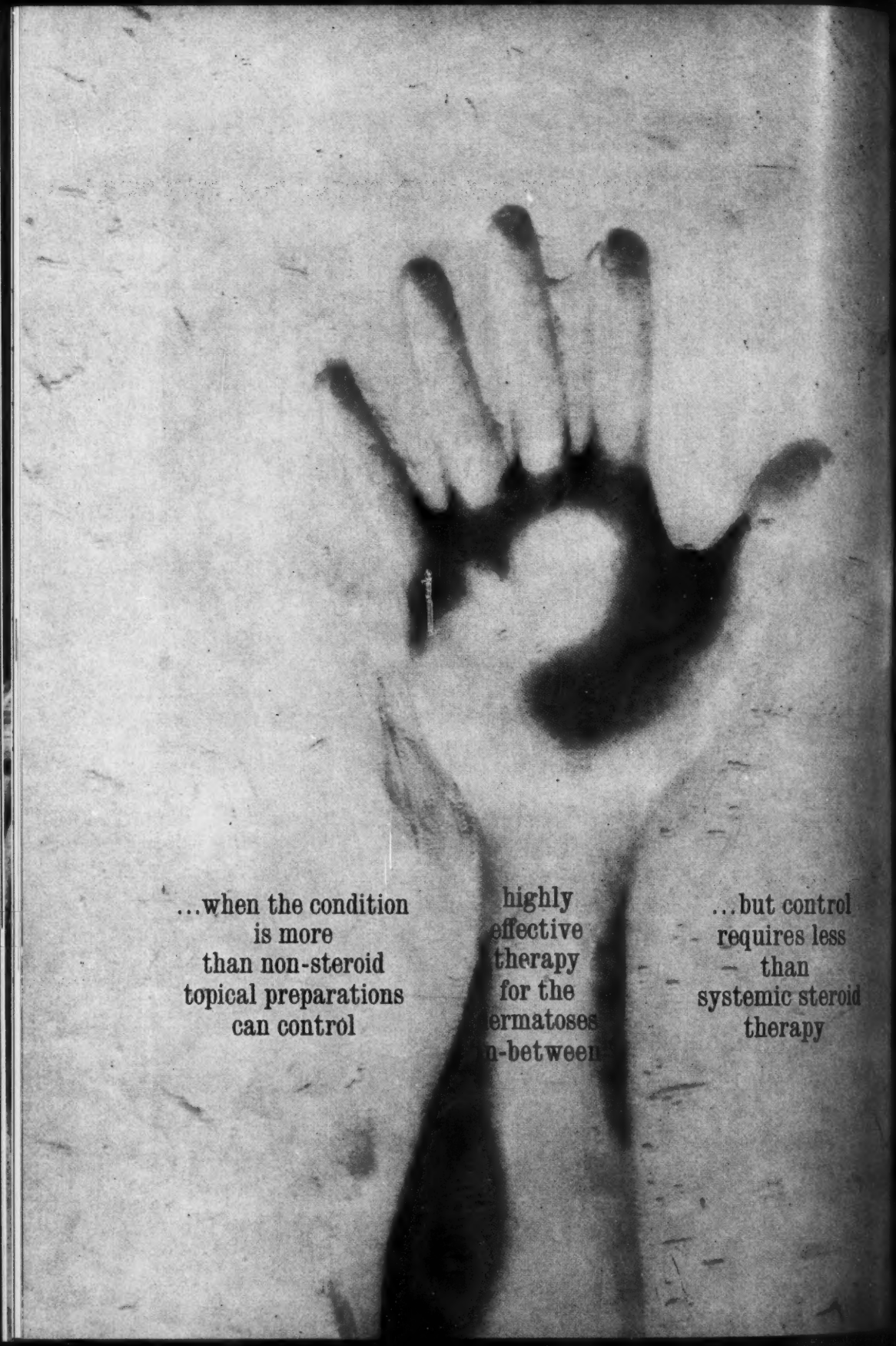
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*Baer, R. L., and Witten, V. H.: Editorial Comment. In The Year Book of Dermatology and Syphilology (1958-1959 Year Book Series). Edited by Rudolph L. Baer and Victor H. Witten. Chicago, The Year Book Publishers, 1959, p. 40.

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(1) Siver, Robert H.: Current Medical Digest, Vol. XXI, No. 9, September 1954. (2) McGivney, John: Texas State Journal of Medicine, Vol. No. 1, January 1955. (3) Frykman, Howard M.: Minnesota Medicine Vol. 38, No. 1, January 1955. (4) Weekes, D. J.: N. Y. State Journal Medicine, Vol. 58, No. 16, August 1958.

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Southern Medical Journal

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Alpha-Chymotrypsin in Cataract Surgery: An Operative and Postoperative Study in 80 Cataract Extractions*

RENE ALTAMIRANO, M.D., and
ALSTON CALLAHAN, M.D., *Birmingham, Ala.*

This recent contribution to cataract surgery offers a better prognosis because of fewer complications than in the past.

BARRAQUER'S[1] DEMONSTRATION of the action of alpha-chymotrypsin in dissolving the binding substance of the zonular fibers was one of the most exciting presentations at the International Congress of Ophthalmology in Brussels. Those fortunate enough to observe his surgical technic in Barcelona, and to study his postoperative patients were even more impressed. Among those who examined a group of eyes from which cataracts were removed with the aid of alpha-chymotrypsin was Dr. Derrick Vail who, at the October, 1958, meeting of the American Academy of Ophthalmology, reported that the eyes in which this substance had been used in cataract extraction were in excellent condition, with thick hyaloid membranes and a minimum of postoperative complications.

With this authentication, a supply of alpha-chymotrypsin was obtained from the P.E.V. Y.A. Laboratories, Barcelona, and later a supply was obtained from the Armour Laboratories. It has now been employed by us in 123 eyes, the first 80 (consecutive) of which are reported herewith. Some of our points of interest are similar to those outlined in the forms used in the present study being conducted by the committee of the American Academy of Ophthalmology on the use of alpha-chymotrypsin in cataract extraction.

Our technic for cataract extraction is begun by securing anesthesia of the globe and akinesia of the lids with injections of Xylocaine to which hyaluronidase and epinephrine have been added.

The surgical procedure is as follows (Fig. 1):

A. After turning down a limbal-based conjunctival flap about 3-4 mm. in width, a groove is made in the limbus with the large cystotome modified into a scleratome by Atkinson. The incision may be located in the sclera if there are indications of corneal dystrophy, or in the cornea if anti-glaucoma surgery has been performed on the eye, or at the limbus in eyes in which the cataract is the only diseased tissue.

B. Two preplaced sutures of dyed silk, size 10-0 are inserted across the groove, one at the eleven o'clock meridian and the other at the one o'clock meridian.

Since this study began, articles have appeared which show that gut suture is unaffected by the enzyme, so we now use buried 6-0 gut sutures on Micro-point needles.*[2,3]

C. After drawing the sutures out of the groove in loops, an incision is made into the anterior chamber through the groove with the von Graefe knife for approximately 1/4 to 1/2 of the intended section.

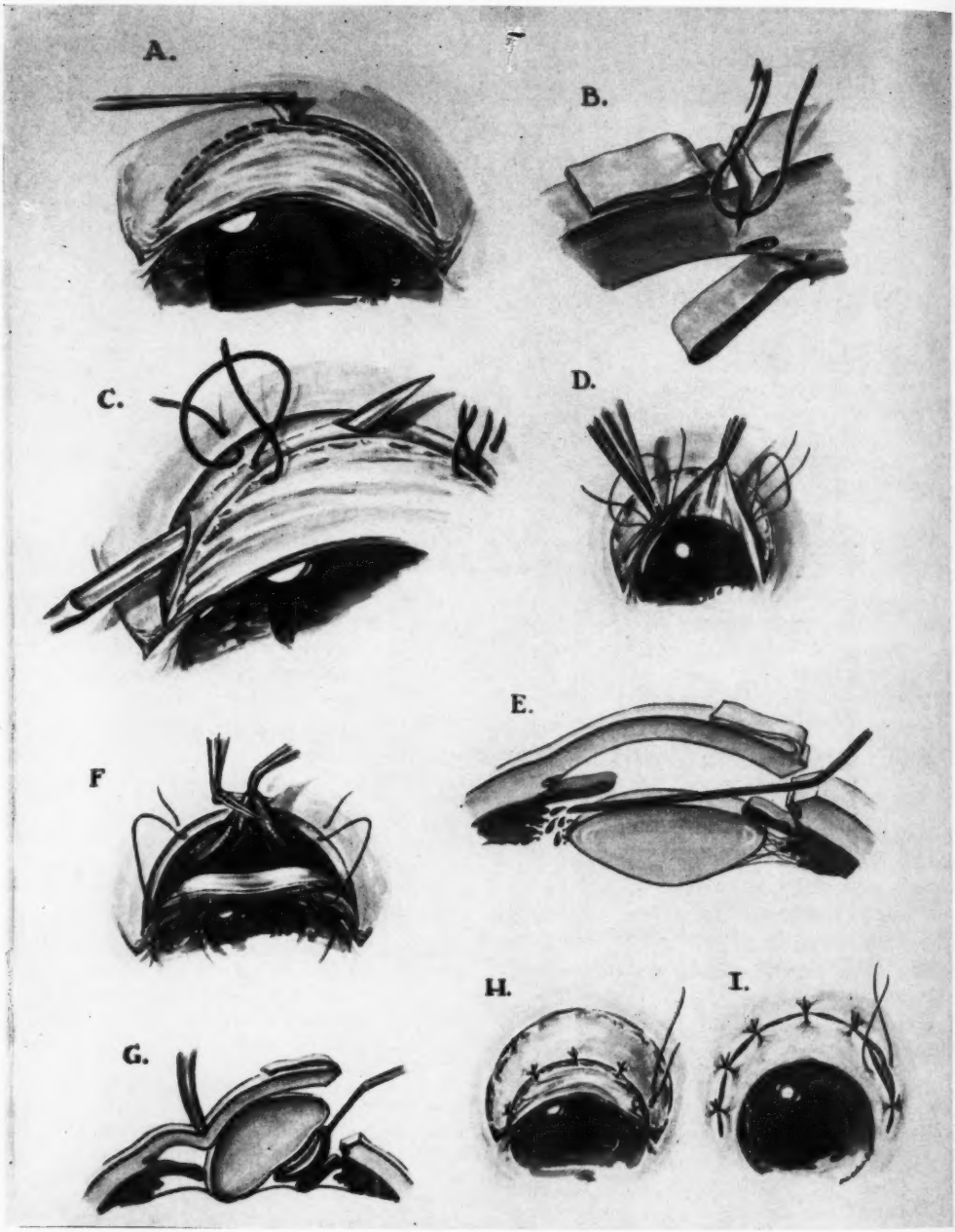
D. With Castroviejo paired scissors, the incision is enlarged to 180 degrees. More recently we have been using King's modification of a small (3 mm.) metal ball on the end of the long blade of the scissors to avoid inadvertently cutting the iris.

E. Using the Troutman[4] irrigator, which is similar to the usual anterior chamber irrigator except for a

*Read before the Section on Ophthalmology and Otolaryngology, Southern Medical Association, Fifty-Second Annual Meeting, New Orleans, La., November 3-6, 1958.

*Micro-point Ethicon, Inc., Somerville, N. J.

FIG. 1



Intracapsular cataract extraction with aid of Alpha-Chymotrypsin.

slight enlargement at the tip, 5 cc. of alpha-chymotrypsin (dilution 1:5000) warmed to body temperature, is injected slowly into the posterior chamber at each major meridian. The utmost care is used to avoid pushing against the lens with this instrument which might dislocate it, or tear the anterior capsule.

F. A peripheral iridotomy is being performed. For eyes with a borderline tension, a full iridectomy is

made; if chronic open angle glaucoma is present, a full iridectomy and sclerectomy are performed.

G. Two minutes after the enzyme has been instilled with the irrigator, the Bell erisophake is applied to the anterior capsule. The lower border of the lens is tumbled out first, and the Budapest lens expressor is used to tuck the cornea behind the lens as it is removed. No scleral pressure is exerted at the lower limbus to rupture the zonular fibers, which was a maneuver we always used until this enzyme became available.

H. The sutures are then pulled taut and tied. The iris is reposited by a stream of saline from the anterior chamber irrigator, which also washes out the remaining alpha-chymotrypsin. Three additional corneoscleral sutures are used to unite the cornea and sclera firmly. These 5 sutures must be placed equidistantly, for if there is uneven spacing of the sutures, the iris may prolapse at the longer unsupported space. Having one side of the section united tightly and the other side united loosely may result in a prolapse on the loose side even though there is no postoperative vomiting and the patient is quiet.

I. The conjunctiva is closed with interrupted 6-0 chromic sutures. An air bubble is injected into the anterior chamber to hold the vitreous away from the cornea, and the eye is bandaged.

Classification

In these 80 patients, 31 were male, 49 were female. Their ages varied from 43 to 87. The types were classed as follows: adult immature 52, adult mature 22, hypermature 2, traumatic 1, congenital immature 1, complicated 2.

Preoperative Complications

Preoperative Glaucoma in the Operated Eye:

In these 80 patients, glaucoma was present in 9 eyes.

1. Closed angle controlled with filtering bleb—3. (These 3 had corneal sections at surgery.)
2. Chronic open angle glaucoma controlled with filtering bleb—1. (Corneal section for cataract removal.)
3. Chronic open angle glaucoma controlled with myotics—3. (Full iridectomy combined with cataract extraction.)
4. Chronic open angle glaucoma, not controlled with miotics—1. (Full iridectomy combined with anterior sclerectomy at cataract extraction.)
5. Phacogenic glaucoma—1. (Intracapsular cataract extraction.)

Other Preoperative Complicating Factors in the Operated Eye:

1. Endothelial dystrophy—2. (Scleral sections performed.)
2. Anterior uveitis—2. (All pathologic activity had ceased.)
3. Posterior uveitis—2. (All pathologic activity had ceased.)

Preoperative Systemic Complications:

1. Diabetes—8. Rizzuti[5] has stated that the alpha-chymotrypsin frequently causes dissolution of some of the pigment from the posterior surface of the iris, but this has not been our general finding even in diabetic cases; it has occurred, but rarely.
2. Hypertension—8.

Operative and Postoperative Complications in Eighty Consecutive Cataract Extractions with Alpha-Chymotrypsin

1. Loss of fluid vitreous before extraction instruments applied—2.
2. Loss of fluid vitreous after extraction instruments applied—1.
3. Loss of formed vitreous after extraction instruments applied—1.
4. Presentation of vitreous without loss—3.
5. Rupture of lens capsule, after extraction instruments applied—3.
6. Rupture of lens capsule, before extraction instruments applied—2.
7. Conjunctival and scleral hemorrhage, requiring application of Hildreth cautery—3.
8. Hyphemia, moderate—4. (Absorbed spontaneously 7 to 9 days.)
9. Shallow anterior chamber first postoperative week—1. (Spontaneous reformation; in more than 7 days—4 (one required instillation of air bubble after 3 weeks).
10. Uveitis, moderate—15.
11. Striate keratitis—15.
12. Iris prolapse—3.
13. Choroidal detachment without delayed reformation of anterior chamber—1.
14. Retinal detachment—1.

Ease of Delivery

It was believed that delivery of the lens was made easier by the enzyme in 64, but not easier in 16 eyes.

Comparison of Complications in a "Control" Series in which One Cataract Was Removed Without Enzyme, the Other Removed with the Aid of the Enzyme

In 31 patients, the cataract had already been removed from one eye before the enzyme became available; special attention was given to these patients since they formed a control series. In the 31 patients, 26 of the "nonenzyme" cataracts were delivered intracapsularily. When the enzyme was used, 30 were delivered intracapsularily. In ease of delivery, 27 were delivered much easier in the "enzyme" eye than the "nonenzyme" eye; 3 were delivered with the same degree of difficulty in both eyes. A comparison of other complications in the "nonenzyme" and the "enzyme" eye is presented in table 1.

Records have been kept of the comparative visual acuities of those eyes in which the enzyme was not used and those in which it was. This comparison is shown in table 2.

Comment

From these records, it can be seen that the incidence of extracapsular extractions and of vitreous loss is less in eyes in which the enzyme is used; the incidence of striate keratitis and uveitis is greater when the enzyme is used. Fortunately, these latter complications have subsided and good vision has been obtained in a greater number of cases in which the enzyme is used. Since no serious and permanent complications occurred in any of the 80 eyes, further study is indicated. Several authors[6] have reported the difficulties of dealing with the dislocated lens after the use of the enzyme; however, this occurred in only one of our entire series. Our preference is to remove the cataract before it has become dislocated, but after it has become sufficiently loose to remove with a minimum of trauma to the eye.

TABLE 1

Complications	*No Enzyme*	*Enzyme*	*Both Eyes in Same Patient*
Rupture of lens capsule	5	1	(1)
Intracapsular delivery	26	30	(17)
Corneal dystrophy	2	1	(1)
Vitreous loss	2	1	(0)
Uveitis	4	2	(2)
Vitreous in AC	3	2	(2)
Striate keratitis	2	7	(1)
Postoperative hyphema	0	1	(0)
Iris prolapse	0	2	(0)
Detached Descemet's membrane	0	1	(0)

Comparison of complications in 31 patients in which cataract extractions were performed in one eye before the enzyme became available, the cataract from the second eye being removed with the assistance of the enzyme.

TABLE 2

Visual Acuity	*No Enzyme*	*Enzyme Used*
20/20	15	13
20/25	5	2
20/30	3	7
20/40	2	5
20/60	0	2 (1 is corneal dystrophy)
20/100	2 (macular degeneration)	0
20/200	1 (vitreous loss)	1 (detached Descemet's)
20/400	1 (retin. pigmentosa)	1 (retin. pigmentosa)
Finger count	2 (corneal dystrophy)	0

Comparison of the visual acuity between the "nonenzyme" eye and the eye in which the cataract extraction was aided by the enzyme in 31 patients.

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Blade-Plate Internal Fixation of Supracondylar Fractures of the Femur*

EARL P. HOLT, JR., M.D., *St. Louis, Mo.*

By this management of supracondylar fractures, the best anatomic restoration may be attained; the use of external fixation may need to be less extensive and early movements of the knee may be begun with a better and earlier end result.

IN EXTENDING the principles and advantages of open reduction and internal fixation to supracondylar fractures of the femur it has been pointed out that a blade-plate can be useful.

Wright[1] reported the use of a blade-plate for fixation in 2 cases of supracondylar fracture of the femur. Umansky[2] made a preliminary report of one case in which he utilized a blade-plate for a supracondylar femoral fracture.

Altenberg and Shorkey[3] reported 3 such cases in which they used blade-plate fixation. They credited Hugh A. Thompson with historical priority for his case, a 22 year old patient, operated upon in 1943. Thompson used no plaster fixation and achieved a good functional result. Altenberg and Shorkey utilized anterolateral incision in the supracondylar area, separating the rectus femoris and vastus lateralis and cutting through the vastus intermedius. They used early postoperative motion and balanced traction. One of their cases was that of fresh fracture. The other two were ununited supracondylar fractures. Good results were attained in each instance.

Scuderi and Ippolito[4] reported the use of blade-plate fixation in 2 fresh supracondylar femoral fractures and in 3 such fractures which had gone to nonunion. They used the above described anterolateral approach. Buck's traction and Thomas' splints were used postoperatively, followed by ischial weight-bearing walking calipers. These authors were favorably impressed with the use of the blade-plate in their 2 fresh supracondylar fractures and in the 3 of nonunion where the plate served as an adjunct to bone grafting.

Elliott[5,6] devised a V-shaped nail with a sturdy, slotted plate shaped to fit the flare of the condyles of the femur for treating supracondylar fractures. He reported its use in about 35 cases; the course in 31 was followed to union. There were 2 instances of fracture of the plate, but there were none with nonunion.

Material

In this series of 25 supracondylar fractures in 23 patients (Table 1 and Figs. 1 to 4), I either performed the operation or assisted a resident who was learning the method. The cases were consecutive and unseelcted. The period extended from November, 1950, to July, 1958. Fifteen patients were women, 8 were men. The average age was 58, not differing greatly from "the fractured hip age." The youngest patient was 21, the oldest 85.

The time elapsing between injury and operation averaged 8 days. In most instances operation was done within 2 days of injury. Of 6 open fractures in the series, 4 were operated upon within a few hours of injury as emergency procedures; the other 2 were debrided and the wounds allowed to heal (8 weeks and 3 weeks) before blade-plate fixation was done. Of the 4 open fractures fixed promptly, all healed without infection. In 2 of these, evidence of delayed union led to bone grafting at about 4 months following which union proceeded uneventfully. Eighteen of these fractures were severely comminuted; 10 were T- or Y-fractures with separation of the femoral condyles.

Operative Technic

The patient is placed in a supine position. To maintain neutral rotation of the thigh, a folded sheet or flat sandbag is placed under

*Read before the Section on Orthopedic and Traumatic Surgery, Southern Medical Association, Fifty-Second Annual Meeting, New Orleans, La., November 3-6, 1958.

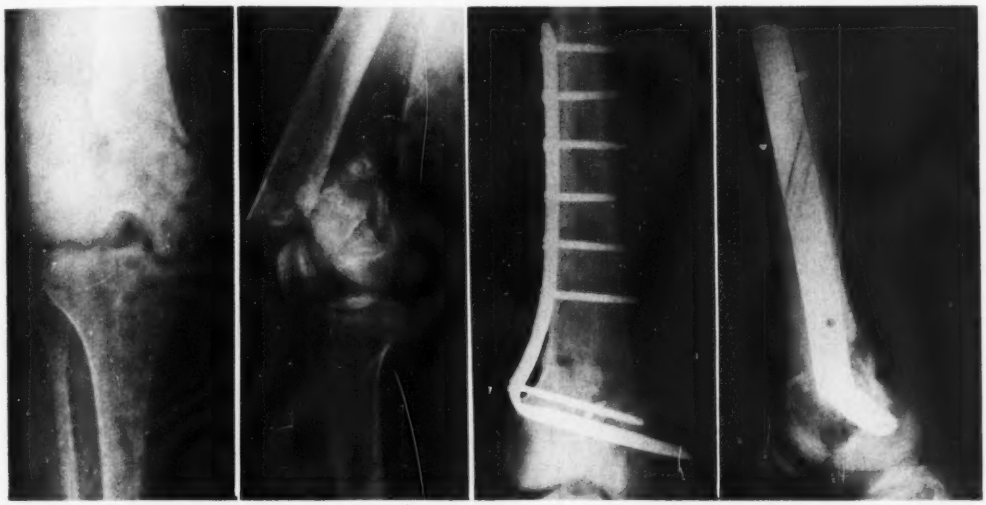
TABLE 1

No.	*Patient*	*Age*	*Date of Fracture*	*Date of Operation*	*Closed*	*Open*	*Comminuted*	*Cast*	*T or Y*	*Ligament Cut*	*Union*	*Result*
1	E. E.	53	11-17-50	1-9-51	0	X	X	0	0	0	6 mos.	180°-90°
2	W. D.	34	5-15-51	6-7-51	0	X	X	X (Unk.)	X	X		
3	M. S.	68	11-11-51	11-21-51	X	0	0	6 wks.	0	0	6 mos.	176°-90°
4	L. D.	57	10-22-52	10-23-52	X	0	0	0	0	0	3 mos.	178°-80°
5	V. H.	55	1-9-53	1-16-53	X	0 (metastagraft)	X	5 mos.	0	0	7 mos.	180°-150°
6	R. B.	24	3-7-53	3-8-53	X	0	X	7 wks.	X	X	3 mos.	180°-90°
7	E. P.	62	3-14-53	3-19-53	X	0 (sepsis) diabetic	0	3 mos.	X	0	6 mos.	Amputation
8	M. C.	57	4-13-53	4-13-53	X	0 (metastatic Ca)	0	0	0	0	4 mos.	Exp. 11-5-53
9	M. C.	68	8-13-53	8-18-53	X	0 (prior fracture)	0	6 wks.	0	0	5 mos.	178°-100°
10	M. W.	85	8-25-53	8-27-53	X	0 (accessory plate)	X	3 mos.	0	0	4½ mos.	Exp. 5 mos.
11	J. B.	73	3-2-54	3-4-54	X	0 (sponge drainage)	0	3 wks.	0	0	4 mos.	180°-90°
12	J. S.	52	9-10-56	9-10-56	0	X (rt. knee op. 9-22 fracture patella and tibia)	X	3 wks.	X	0	3 mos.	180°-90°
13	D. B.	22	2-8-56	2-8-56	0	X (delayed union)	X	0	X	X	Bone graft at 13 wks. union 5 mos.	180° full squat
14	T. J.	21	5-12-58	6-2-58	X	0 (opposite leg amputated B. K.)	X	2 wks.	0	0	3 mos.	180°-80°
15	C. T.	69	4-6-55	4-25-55	X	0	X	6 wks.	X	X	3 mos.	180°-70°
16	L. P.	69	6-1-58	6-14-58	X	0	0	6 wks.	0	0	3 mos.	178°-90°
17	M. L.	73	11-9-57	11-10-57	X	0 (bilateral)	X	3 wks.	X	X	6 mos.	Rt. 180°-90° Lt. 180°-90°
18	A. C.	34	3-26-57	3-26-57	0	X (sinus tract until nail out)	X	3 wks.	X	X	5 mos.	176°-110°
19	L. H.	62	11-27-57	12-4-57	X	0	X	0	X	0	10 wks.	180°-90°
20	M. B.	64	11-1-57	11-20-57	X	0	X	3 wks.	X	0	3 mos.	178°-80°
21	D. S.	63	4-30-58	4-30-58	X	0	X	3 wks.	X	0	8 mos.	178°-80°
22	M. M.	74	7-26-58	7-27-58	X	0 (bilateral)	X	6 wks.	0	0	3 mos.	Rt. 175°-110° Lt. 180°-70°
23	M. T.	85	7-22-58	7-22-58	X	0 (old fracture site)	X	0	0	0	10 wks.	175°-90°
	Average	58	First case	1-19-51								
			Last case	7-26-58	19	6		2 wks. 5 mos.	11	6	average union 4 mos.	178°-90°

the hip. To relax the pull of the gastrocnemius, the leg-rest of the table is dropped about 20 degrees. A pneumatic tourniquet may be used high on the thigh. The leg is draped free. With adequate anesthesia skeletal pin traction is unnecessary. A true lateral skin incision, which may be extended downward to curve below the patella through which the lateral expansion of the quadriceps and the patellar ligament may be divided, provides complete access to all fragments and makes exact reduction of the articular surfaces of the condyles relatively simple. In 6 of the 25 fractures, the patellar ligament was divided with no increase in problems of postoperative management or later complications.

The fracture zone of the distal femur is exposed by separating the vastus lateralis from

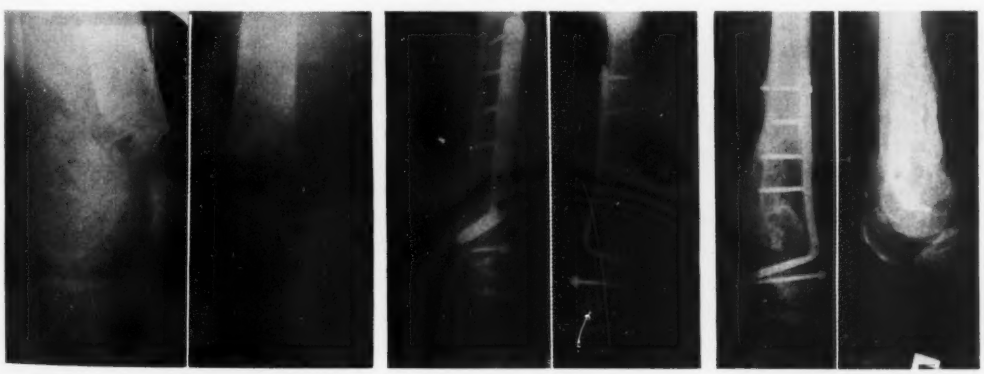
FIG. 1



A B

(Case 1) (A) Closed comminuted T-fracture (automobile accident) of the supracondylar portion in a 24 year old woman. Fairly exact reduction and stable fixation was achieved with a Moore-Blount blade-plate; section of the patellar ligament facilitated reconstruction of the fragments. A long leg cast was employed for 6 weeks. (B) Clinical and x-ray evidence of union is present at 14 weeks. An excellent end result permitted active extension to 180 degrees and full squatting.

FIG. 2



A B C

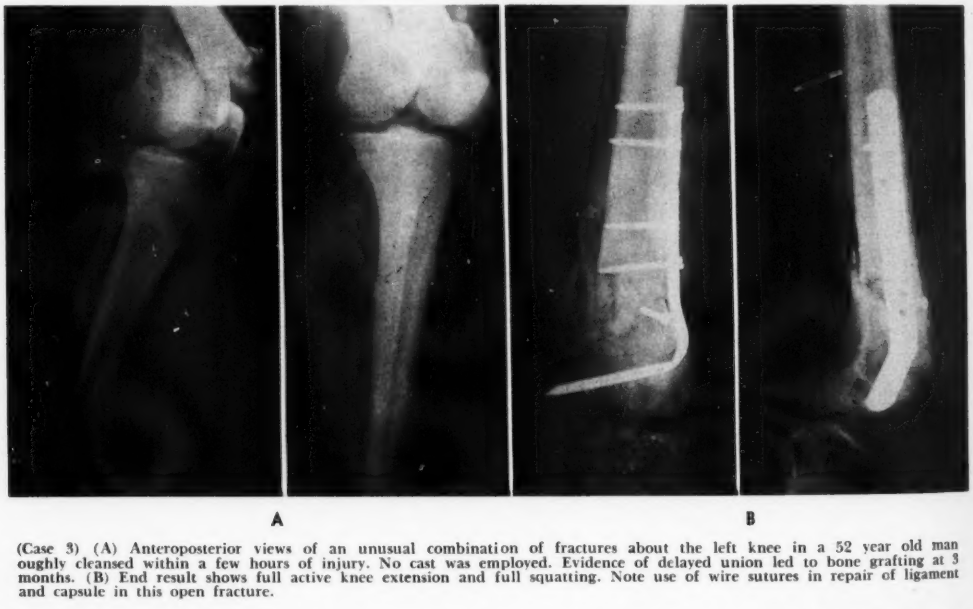
(Case 2) (A) Closed comminuted supracondylar T-fracture, in a 69 year old man required an accessory Knowles pin to hold the major condylar fragments. The patellar ligament was severed and repaired with silk. (B) Early postoperative x-ray studies in two views in a light, long leg cast. (C) Excellent end result; x-ray findings at 2 years.

FIG. 3

A B

(Case 3) (A) Anteroposterior views of an unusual combination of fractures about the left knee in a 52 year old man struck by a car. A large open wound exposed a comminuted supracondylar fracture of the femur, a fractured patella with separation, and fractures of upper tibia and fibula. Access to the knee was provided through the separated patellar fragments, thus section of the patellar ligament was not necessary. (B) Clinical and x-ray evidence of union of all fractures at 5½ months. Patient is ambulatory with a range of motion of from 180 to 90 degrees.

FIG. 4



A B

(Case 3) (A) Anteroposterior views of an unusual combination of fractures about the left knee in a 52 year old man oughly cleansed within a few hours of injury. No cast was employed. Evidence of delayed union led to bone grafting at 3 months. (B) End result shows full active knee extension and full squatting. Note use of wire sutures in repair of ligament and capsule in this open fracture.

the biceps and from the lateral intermuscular septum. The blade-plate is shaped with bending irons to fit the side of the femur. Through a slot created by drill holes, the blade is driven into the cancellous bone of the condyles. When the condyles are separated tem-

porary fixation in reduction with a pin or screw will facilitate transfixion with the blade. In placing the blade-plate care must be exercised to avoid varus, valgus, or recurvatum angulation. If indicated, the position of the nail and fragments should be checked by anterior-posterior and lateral roentgenograms in the operative field.

When protection of the assembly seems indicated, postoperative management should include a long-leg plaster cast. If fixation is adequate, a simple dressing may be used with balanced suspension with active and passive exercises. Drill of the quadriceps muscle is begun early and nonweight bearing ambulation with crutches is frequently permissible. Weight-bearing is deferred until clinical and roentgenologic union are obtained.

Protective leg casts were used in 17 of the 23 patients (19 fractures) for periods varying from 2 weeks to 5 months. A conscientious effort was made to reduce such fixation to a minimum. It is believed that the two cases of delayed union mentioned above would have united readily with plaster immobilization for a conventional length of time. Both were open fractures,—one 22 year old had no cast, the other, aged 63, had one for 3 weeks only. This is offered as a word of caution to enthusiasts who would omit plaster altogether.

Results

There were no nonunions. The average length of time to union of these fractures was approximately 4 months. The 2 cases of delayed union have been mentioned above. In 2 cases sinus tracts persisted after union of the fracture and healed only after removal of the nail. Low-grade infection developed in the knee of a 62 year old obese diabetic; the supracondylar fracture healed but the leg eventually needed to be amputated.

The average range of motion recovered in these 25 fractures was from 178 degrees of extension to 90 degrees of flexion. In general, the shorter the period of immobilization the better the eventual range of knee motion. This fact is explained to some extent by the direct ratio between the length of immobilization in plaster and the severity of the injury.

Summary and Conclusions

1. Twenty-five supracondylar fractures of the femur in 23 adult patients are reported in which a lateral incision reflecting the quadriceps was used and found to be preferable to an anterolateral muscle-cutting incision.

2. In T-fractures with displacement, division of the patellar ligament is recommended. Healing time for this ligament is generally no longer than that for the associated fracture. All factors considered, the two best results in this series occurred in cases in which the patellar ligament was divided.

3. Blade-plate fixation of supracondylar fractures of the femur allows maximum restoration of anatomic relationships, provides good internal fixation, and minimizes external fixation both as to time and degree. In addition, blade-plate fixation of these fractures can reduce the time of hospitalization and recumbency. End results from blade-plate fixation have been satisfactory. The procedure is presented as the method of choice in the management of this fracture of recognized complexity.

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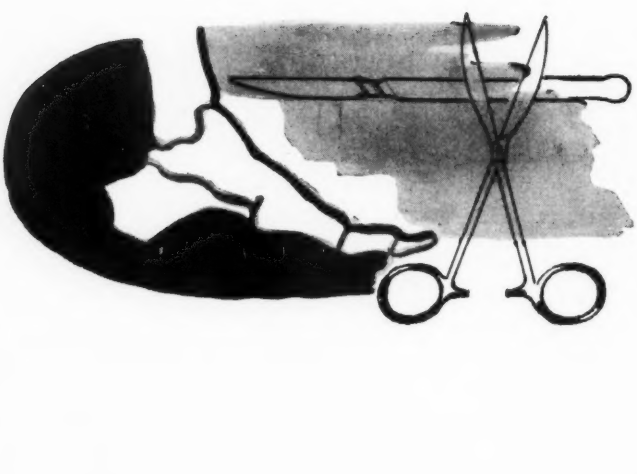
Discussion (Abstract)

Dr. F. DeWitt Sanford, Orlando, Fla. Open reduction and internal fixation of a supracondylar fracture of the femur can give anatomic replacement of the fragments and sufficient fixation to allow external support to be reduced to a minimum. It was noted with interest that Dr. Holt does not hesitate to cut through the patellar tendon. Although we have not cut this tendon in any of our cases, as pointed out by Dr. Holt, doing so apparently does not add difficulties to the management of the patient. It is important to visualize the articular surface of the femur so anatomic replacement of the fragments is obtained without leaving rough surfaces to invite traumatic arthritis.

Since 1950, we have treated 38 fractures by this method with gratifying results. No plaster, traction, nor external fixation have been used postoperatively. Knee motion has been started on the third or fourth postoperative day, or as soon as pain will permit. Excellent range of knee motion has been preserved in each patient. We have had no serious complications resulting from early knee motion. In one patient in whom the plate broke, there was a delayed union

which required another nail and graft; bony union was obtained. We believe the advantages of early knee motion outweighs the risks involved.

We have found it to be of advantage to use bone chips from the ilium at the fracture site, and believe the grafts reduce the time required for bony union. We use the supracondylar nail described by Jewett and, when necessary for stability, use additional fixation by screw or bolt. Dr. Holt is to be congratulated on his excellent presentation.



The Management of the Elderly Cardiac*

RALPH M. DENHAM, M.D.,† *Louisville, Ky.*

In an aging population the family doctor is frequently called upon to treat cardiac disease. Since it often has aspects not common to heart disease in the younger age group, some thought should be given by every physician to the recognition of these differences and their treatment.

THE OLDER CARDIAC PATIENT presents few problems unlike those of the younger patient but some of these may actually modify the treatment of these patients. Factors of importance are whether the patient is aged (physiologic) or senile (pathologic), whether he is active or inactive, and whether medical problems exist which restrict physical activity, add to the cardiac load, or influence the manner in which he responds to his environment. Most of us recognize that many oldsters do not accept strict medical regimens, changes in their diet, nor transfer to a strange environment as readily as do younger people. The elderly patient frequently has plenty of time to spend dwelling on his heart problem and should not be rushed by his busy physician.

This discussion will consider the specific problems of congestive failure, coronary artery disease and cardiac arrhythmias as seen in patients who are 65 or more years old. Other problems are perhaps of equal importance, but we shall omit from this discussion the problems that attend arterial hypertension, surgical procedures, electric shock therapy, and other less frequent problems.

William Dock[1,2] described presbycardia (senile heart disease) and since then other authors have elaborated on this clinical entity. He described this as the "small brown heart" in which there is an increase in subepicardial fat, some thickening of the heart valves, atrophy of myocardial fibers and increased pigmentation of the fibers. He points out that these involutional changes alone do not cause heart failure but that the reserve is poor, and overexertion, emotional tachycardia, infection, elevation of the blood pressure, and a high salt diet may precipitate failure. If none of these mentioned stresses are operating the patient may be free of symptoms. The physical examination may reveal premature beats, bradycardia, systolic murmurs at the aortic and mitral areas, and the heart size may be normal.

In this age group the physician will encounter the more common types of heart disease due to arteriosclerosis, systemic and pulmonary hypertension, and occasionally rheumatic heart disease. Calcific aortic stenosis may exist. Syphilitic aortitis is rare and congenital heart disease is seen even less frequently. Bacterial endocarditis occurs infrequently but must be excluded at times.

Congestive Failure

In considering congestive heart failure in the aged one usually encounters classical findings of heart failure but at times it may be atypical. Some factors which may confuse the physician are the following. The heart may appear to be of normal size in contrast to the usual patient in heart failure who shows enlargement. Could this normal appearing heart be a "small brown heart" which has dilated and is further obscured by pulmonary emphysema? In addition, pulmonary emphysema and fibrosis may mask or mimic the signs of congestive heart failure. An upper respiratory infection may be followed by a persistent cough which is attributed to the infection when it actually represents insidious left ventricular failure. Fatigue may be an outstanding complaint and is usually difficult to evaluate. Vague digestive disturbances secondary to hepatic congestion may occur. In my experience isolated pleural effusion may be

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an early finding in heart failure in the aged. This must be differentiated from malignancy, pulmonary infarction, and other causes of pleural effusion. The older patient has a tendency to bradycardia and in the presence of sinus rhythm the heart rate may be an unreliable index as to whether congestive failure is present.

The problem then exists as to whether the symptoms and signs are due to heart failure. If the history, physical examination, electrocardiogram, and chest roentgenogram leave doubt, the simple procedures of venous pressure and circulation time may then aid in differentiation.

The following patient illustrates a diagnostic problem.

Case 1. A 67 year old judge complained of progressive weakness, shortness of breath and weight loss over a period of 4 months.

Physical examination revealed evidence of recent weight loss, dyspnea upon slight effort, slight cardiac enlargement with no engorgement of the neck veins. There was slight dullness at the left lung base and a few scattered moist rales bilaterally. The liver was barely palpable. No edema was present. Chest flouroscopy and x-ray revealed cardiac enlargement, slight pleural effusion and pulmonary congestion (Fig. 1,A).

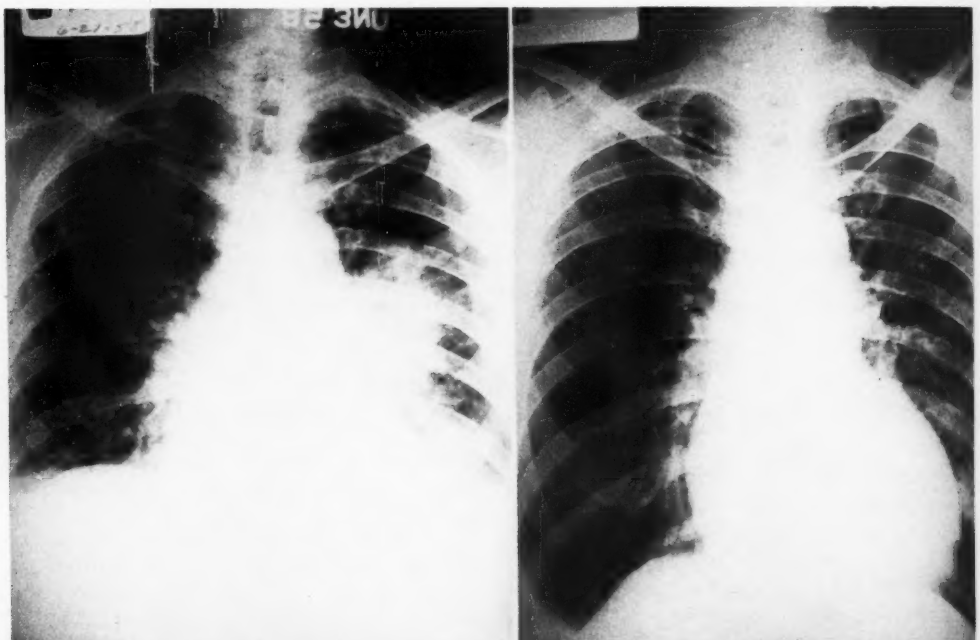
The possibility of malignancy was considered on the basis of the dense shadow at the left hilus and the clinical history. Rapid clearing of these findings occurred after sodium restriction, rest, digitalization and diuretics (Fig. 1,B). This therapy resulted in great symptomatic improvement and verified the diagnosis of congestive heart failure.

In the elderly person myocardial insufficiency may represent advanced heart disease about which little can be done. On the other hand correctible cardiac or extracardiac factors may exist and their elimination may result in improved cardiac function.

Cardiac arrhythmias should be controlled. The conversion of auricular fibrillation may restore cardiac compensation or reduce the functional incapacity.

A careful search for hidden infection which imposes extra work on the heart is in order, remembering that in the older patient the re-

FIG. 1



A B

(Case 1) (A) On June 21, 1958, there was an apparent mass at the left hilum suggestive of tumor. Other changes were consistent with pulmonary congestion and pleural effusion. (B) On June 30, there had been marked clearing of the lung fields, including the suspicious left hilar "mass."

sponse to bacterial infection frequently is atypical in that there is little elevation of temperature and perhaps no leukocytosis. Anemia, if present, should be corrected. Hyperthyroidism may be masked in the elderly patient with heart failure. The basal metabolic rate is inaccurate in this situation but I^{131} uptake study and the determination of protein-bound iodine may be more helpful. Correction of hyperthyroidism will frequently relieve heart failure.

The problem of obesity is infrequent in this age group but weight loss may relieve heart failure. Malnutrition, on the other hand, may present a problem and beri-beri heart disease has been recognized frequently in the senile patient with poor dietary habits.

The physical status of these patients has considerable influence on the control of heart failure. A spry old man can keep himself in constant trouble, whereas one who is content to sit in his rocking chair may have very few symptoms even though he has a similar degree of heart disease. Mental stress and turmoil in a strange environment may produce tachycardia and add to the difficulty of controlling symptoms.[2]

Pulmonary infarction occurs frequently in oldsters and may precipitate heart failure if some heart disease is present. Such a situation is illustrated by the following patient.

Case 2. A 77 year old man had the sudden onset of severe pain in the right chest, aggravated by respiration and cough and accompanied by hemoptysis. There was no previous history of heart disease. He had been taking Stilbestrol for one year for benign prostatic hypertrophy.

Physical examination on the day of onset revealed a critically ill patient who was short of breath, grunting with pain, and cyanotic. A pleural friction rub was present at the right base. The apical heart rate was 140, and the electrocardiogram confirmed auricular flutter with a 2:1 block. The legs revealed no edema or calf tenderness.

The diagnoses of acute pulmonary infarction, arteriosclerotic heart disease, and auricular flutter were made. Hemoptysis was so gross that anticoagulants were not given. The auricular flutter converted to auricular fibrillation on the 6th day after receiving large amounts of digitalis. Sinus rhythm was restored on the 14th day. On the 22nd day an acute thrombophlebitis was found in the left leg. Anticoagulants were then started and the patient was discharged without further complications on the 46th day of illness.

An x-ray film showed the appearance of the heart and chest on the first day (Fig. 2,A). Emphysema and slight cardiac enlargement, as well as the shadow in the right lower lung field, were noted. The follow-up roentgenogram showed clearing of the lungs on the 46th day of illness (Fig. 2,B).

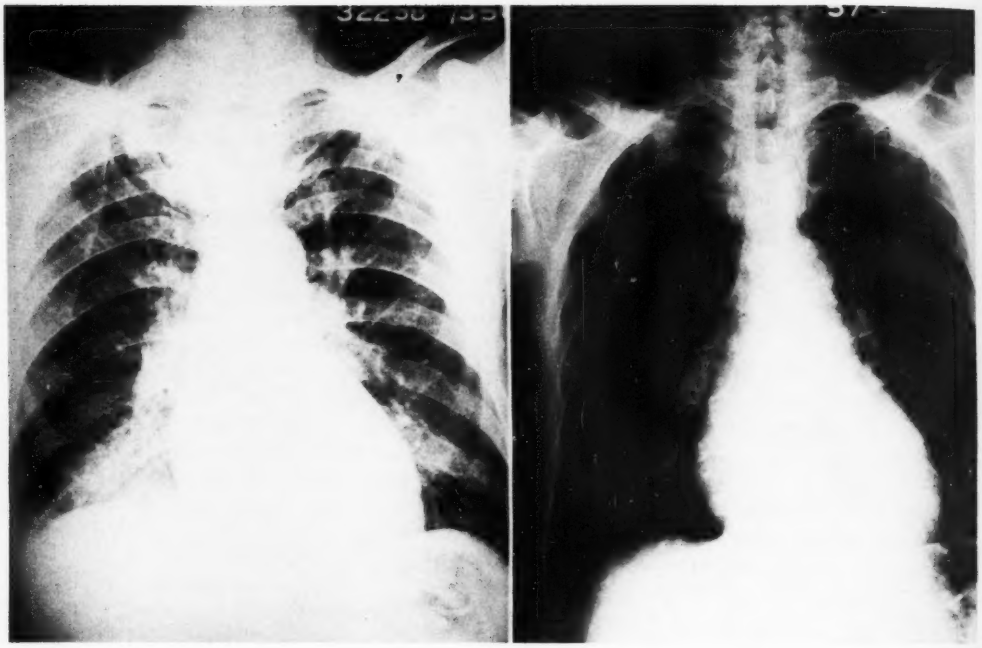
The *treatment of congestive failure* in the elderly patient consists of rest, digitalis, diuretics and sodium restriction as in the other age groups. Deficiency of water-soluble vitamins may develop in the patient receiving frequent diuretics and the program should be supplemented to replace this loss. At times it is necessary to use empirically antibiotics, if there is suspicion that infection exists which is aggravating heart failure. Oxygen therapy is used for acute left ventricular failure along with other measures. Sedation and measures to control cough to avoid exhaustion is of importance in the elderly. Aspiration of pleural and ascitic fluid if present aids materially in relieving the patient.

It is my belief that the elderly cardiac is more susceptible to the toxic effects of digitalis. For this reason the patient is digitalized more slowly, preferably by the oral route unless there is a strong indication for parenteral therapy. I prefer using one of the shorter acting preparations such as Digoxin or gitalin rather than a preparation of more enduring action. The prolonged effect of digitoxin, sometimes exceeding 3 weeks after discontinuation of the drug, is a definite and serious disadvantage. Lown and Levine[3] point out that in the seriously ill cardiac patient the symptoms of digitoxin overdosage cannot be distinguished from increasing decompensation by the simple expedient of stopping digitalis administration for a few days.

Ten patients with congestive heart failure of moderate to severe degree and whose age range was 75 to 90 years (average 79 years) were observed by us. The maintenance dose of gitalin averaged 0.35 mg. daily during an observation period averaging 25 months each. A larger group whose ages were less than 55 years required an average daily dose of 0.55 mg. of gitalin (16).

Digitalis intoxication in the aged has certain peculiarities. Anorexia is the most frequent complaint, but on several occasions I have observed weight loss occurring over a period of several weeks in the absence of recognized anorexia. With a decrease in the maintenance dose of digitalis the patient may regain a few pounds in weight without developing an increase in congestive failure. Mental confusion, weakness, and listlessness

FIG. 2



A B

(Case 2) (A) On March 22, 1958, pulmonary emphysema obscured somewhat the true heart size. The infiltration at the right base represents pulmonary infarction. (B) On May 7, the lung fields had cleared except for residual changes at the right base. The emphysema was now quite apparent since the congestive changes have cleared.

may occur with over-digitalization. Many observers agree that cardiac arrhythmias are more frequent in the digitalized older patient and should be watched for with great care. Resistant heart failure paradoxically may be due to digitalis. With the appearance of resistant heart failure in any cardiac patient the possibility of digitalis intoxication should be considered.

Potassium depletion may aggravate digitalis intoxication and restoration of the potassium deficit may modify symptoms and signs of intoxication. Diuretics should be omitted if an overdosage of digitalis is even suspected.

In the use of diuretics in the elderly the chief considerations should be whether genitourinary obstruction is present and whether renal function is adequate. The dose should be controlled to avoid dehydration. The newer oral diuretics may be effective and avoid the necessity of parenteral mercurial therapy.

Coronary Insufficiency

Coronary artery disease may actually decrease somewhat in incidence in the age group above 70 years.[4] However, in these older patients when it does exist it may follow the same patterns of angina pectoris, coronary insufficiency, and myocardial infarction which the younger person may manifest. Nevertheless, there are certain differences to be considered.

Angina pectoris may manifest itself by nocturnal angina and angina decubitus more frequently in this age group. One almost immediately becomes wary of an impending infarction with the appearance of these symptoms in younger patients, but I have had the experience of having these symptoms go on for a number of months or years in the elderly without the appearance of definite myocardial infarction. Here again the physical status and activity of the patient dictates the amount of difficulty that he will have. Again the spry old gentleman is going to have more symptomatic difficulty than the sedentary companion.

The prognosis of angina in these patients

is as difficult to assess as it is in other age groups. However, if it is not of recent onset and there is no increase in the frequency or duration of the attacks one may reasonably assume that the prognosis is fair.

One must consider factors such as anemia, biliary disease, metabolic overload and physical activities, since correction of these may lead to alleviation of the angina.

Management of the patient with angina pectoris is accomplished by control of physical activities, mild sedation, and explanation of the patient's disease insofar as possible rather than relying entirely on oral medications. In the older cardiac patient I have been rather disappointed in the results obtained by the longer-acting nitrates such as pentaerythritol tetranitrate, mannital hexanitrate and other long-acting drugs. Nitroglycerin is indispensable in the control of pain. Whether dietary factors are of great importance remains to be seen. Perhaps by avoiding lipemia of significant degree one may be able to reduce the attacks of angina. Ablation of the thyroid gland with radioactive iodine has occasionally been helpful in the euthyroid patient who is greatly disabled by angina pectoris.

Myocardial infarction in the elderly patient may be masked by previous angina. There may be no period of premonitory symptoms or build-up in the intensity of angina. He may have an attack only slightly different from his usual anginal episode which may on follow-up study prove to be an actual infarction. Silent infarctions may occur due to masking by other illness, such as acute pulmonary edema, postoperative state or painless myocardial infarction. The elderly patient with acute myocardial infarction is much more apt to develop congestive heart failure, especially left ventricular failure, than is the patient in the younger age group.

Age of the patient is no contraindication to anticoagulants if they are properly controlled. Unless the patient is in severe shock he is usually allowed out of bed during the first week or by the end of the first week. Bed and chair rest is then carried out for the next 4 to 6 weeks depending upon the severity of the infarction. The prognosis in the older patient with myocardial infarction becomes progressively worse with increase in age.

Cardiac Arrythmias

Cardiac arrhythmias as seen in the geriatric patients are increased in frequency. This is particularly true of the patient receiving digitalis.

In the presence of cardiac arrhythmias in the older age group the aim must be control of the ventricular rate. This is important because if a very rapid ventricular rate is allowed to continue for any length of time myocardial ischemia and congestive failure may develop rapidly. Also the problem of cerebral ischemia or even thrombosis may arise. Emboli are more frequent in arrhythmias with rapid ventricular rates than if the rate is controlled. These complications occur less frequently in younger patients.

Premature contractions are frequent in the older age group. These usually require no medication. Atrioventricular heart block of the first degree is also seen often and again may not cause any particular clinical problem.

Auricular fibrillation is one of the most common arrhythmias seen in the older cardiac. At times it is unnecessary to give medication. Some of the older cardiac patients may have auricular fibrillation for several months or years with a relatively normal ventricular rate and require no digitalis. Others will not do well without the use of digitalis to control ventricular rate. Still others may do better if an effort is made to convert the auricular fibrillation to sinus rhythm. At least one study has shown that patients in the arteriosclerotic age group are more easily converted to sinus rhythm and more easily held in sinus rhythm than are younger patients with rheumatic heart disease.[5]

Auricular flutter is an infrequent problem in this age group. It should be controlled by use of digitalis and quinidine if necessary.

Ventricular tachycardia occurs rarely except as a complication of myocardial infarction. This is an urgent situation and must be handled without delay in these patients. At the present time I believe the best way to manage ventricular tachycardia with a rapid ventricular rate is by use of intravenous procaine amide carried out during electrocardiographic monitoring. In the management of ventricular tachycardia quinidine is a useful drug as well as procaine amide.

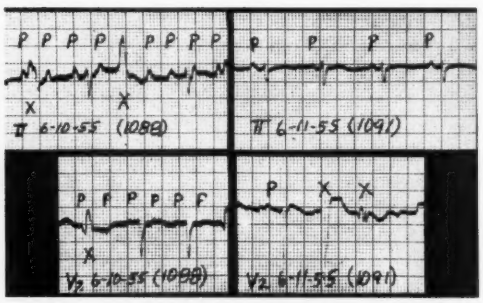
An important arrhythmia in this age group

is *paroxysmal auricular tachycardia* with block. The importance of this arrhythmia is that it is frequently associated with digitalis intoxication. It is often confused with auricular fibrillation because the block may be of an irregular nature (Fig. 3). The ventricular rate may be rather rapid, and unless one identifies this arrhythmia by electrocardiography he is apt to increase the dose of digitalis to try to slow the ventricular rate when proper management would dictate omission of digitalis and management of digitalis intoxication. The electrocardiogram is also useful in verifying the presence of auricular flutter and ventricular tachycardia when they are suspected.

A major point to consider in the management of these supra-ventricular tachycardias is to be sure that digitalis intoxication is absent, and if such is absent to give sufficient digitalis to control the ventricular rate. Quinidine should be used if digitalis alone fails to control the arrhythmia.

Adams-Stokes syndrome is more common in the older patients than in the younger groups who manifest complete heart block.[2] In evaluation of the patient who comes in with periods of syncope or convulsions and in whom one suspects this disorder, it is important to rule out not only disease of the central nervous system but to evaluate the cardiac problem from the standpoint of arrhythmias. Electrocardiograms are of value in searching for A-V heart block, ventricular premature contractions, ventricular tachycardia or fibrillation which may occur during such seizures or in between such seizures. A check for carotid sinus hypersensitivity is in order in many of these patients but should be performed with caution.

FIG. 3



Paroxysmal auricular tachycardia with block and irregular ventricular rhythm due to digitalis intoxication. By auscultation this mimics auricular fibrillation.

Frequently these problems are of a terminal nature and impossible to control even with the best of management. However, the use of atropine to inhibit vagal reflexes and isoproterenol hydrochloride (Isuprel) to stimulate nodal pacemakers may be of considerable value. The use of epinephrine parenterally during an acute seizure due to heart block may be lifesaving. Quinidine and procaine amide are of uncertain value and may actually aggravate the condition in a patient who is having alternate bouts of ventricular tachycardia with bouts of cardiac arrest.

Comment

The older cardiac patient at times presents a unique challenge to the art of medicine as well as thought-provoking clinical problems. Recognition of these problems and careful management will often restore the elderly to several months or years of useful and comfortable life. Age itself should be no contraindication to an all-out effort to evaluate these problems accurately and to treat them wisely, realizing that differences exist which influence the management of the geriatric heart patient.

Summary

Several factors have been discussed which influence the diagnosis, treatment and general care of the elderly cardiac patient.

The specific problems concerned with congestive heart failure, cardiac arrhythmias and coronary artery disease have been reviewed and recommendations for their management have been presented.

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The Genghis Khan of the 1959 Microbial World*

THOMAS F. PAINE, JR., M.D.,† *Birmingham, Ala.*

This paper points up some of the dangers of the indiscriminate use of antibiotics and a more casual practice of asepsis because of a false sense of security based on antimicrobial therapy.

ONCE UPON A TIME there was a good little organism called *Staphylococcus aureus*. The time was about 1946. This little organism had not always been a good little creature but had decided to behave after "getting its pants scared off" by a new and fearless defender of the public, known as penicillin (Fig. 1). Several years later, in 1959, penicillin appears exhausted from overwork and the staphylococcus now swaggers around as "top-dog" (Fig. 2) in our hospitals.

Our current dilemma is a result of at least three factors: (1) the overzealous use of antibiotics, (2) the development of drug-resistant strains of staphylococci, and (3) the deterioration of hygienic practices in hospitals.

(1) *Use of Antibiotics.* In 1939, penicillin was a new experimental laboratory material at Oxford University. Because of the war and the need for antimicrobial drugs for the treatment of casualties, much effort went into learning how to produce penicillin. Large vessels were needed for growing the mold and the practical English are reputed to have found that bedpans would serve this purpose quite well. Penicillin was then so scarce that it was recovered for re-use from the urine of patients under treatment. One case in a 1941 report from Oxford was that of a policeman who was treated with penicillin recovered from urine, giving rise to the story that penicillin was a remarkable substance, grown in bedpans and purified by passage through the Oxford police force![1]

FIG. 1

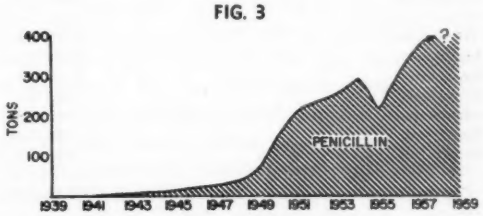
Penicillin was effective against most staphylococci in 1946.

FIG. 2

The 1959 hospital staphylococcus is indifferent to penicillin and to several other antibiotics.

During the war years penicillin soon became plentiful enough to treat service personnel, and in 1946 the antibiotic came into commercial use. Figure 3 shows the increase in production of penicillin since 1939 in the United States. With the exception of the year, 1955, the amount of penicillin produced annually has continued to increase despite the discovery of many other antibiotics.[2] If pro-

FIG. 3



National production of penicillin.

*Presented at the meeting of the Medical Association of the State of Alabama, Birmingham, April 10, 1959. Preparation of this paper was aided by Grant E-938(C2), USPHS.

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duction for 1958 reached 400 tons, as seems likely, this amount of penicillin would have provided each man, woman and child 3 or 4,000,000 units. Since several of us rugged souls took no penicillin at all last year I suspect that some of our citizens received more than their quota. The production of antibiotics other than penicillin has also continued to increase. Though the national production figures of all antibiotics are not in hand, the amounts of antimicrobial drugs used in a local hospital during the past year offer an indication of the general use of these agents. Table 1 lists the amounts of antimicrobial drugs, except for isoniazid and p-aminobenzoic acid, used in the 600 bed University Hospital, Birmingham, Alabama, for the one year period from March, 1958, through February, 1959. With a total usage of 158,596 grams per year, each of our 25,000 admissions could have received about 6 grams of antibacterial agents. Dispensing 3,000 grams of antimicrobials per week should keep our pharmacist quite busy. Problem patients may receive more than their 6 gram average; table 2 lists the agents received by one Pediatric-Orthopedic patient during a 96 day stay in the hospital. On the basis of the amounts of antimicrobial drugs used at the University Hospital for one year, we can estimate that about 826 tons of antimicrobials, other than penicillin, were produced for the past year in the United States.

"One gathers that 'aqueous penicillin' has been translated by some as 'penicillin to be given out like water.' However, the pressure—and anyone dealing constantly with patients knows that it is a pressure—exerted by a public that has become aware of the benefits but unaware of the dangers of newer drugs, certainly does not make the physician's life any easier. Since repeated warnings by others have had no very gratifying results, this reviewer has no illusions that anything written here will stop the trend. On the contrary, he confidently expects the day when penicillin injections will be dispensed in drug stores by slot machines set up between the counter and the pinball machines. The lines forming in front of them during the season of coughs and colds will be something to see."[3]

TABLE 1

*Antimicrobial Drugs Dispensed at University Hospital, Birmingham, Alabama, Mar. 1, 1958, through Feb. 28, 1959**

Penicillin	51,737 Gm.
Sulfonamides	37,660 Gm.
Streptomycin	30,602 Gm.
Chloramphenicol	18,882 Gm.
Tetracyclines	9,589 Gm.
Erythromycin	4,592 Gm.
Neomycin	3,158 Gm.
Novobiocin	1,086 Gm.
Nitrofurantoin	525 Gm.
Kanamycin	322 Gm.
Others	443 Gm.
Total	158,596 Gm.

*Does not include isoniazid or p-aminobenzoic acid.

TABLE 2

Antimicrobial Drugs Dispensed for One Patient During a 96 Day Stay in the University Hospital, Birmingham, Alabama

194 tab. (0.5 Gm.) Sulfadiazine	97.00 Gm.
167 million units Penicillin	100.20 Gm.
142 cap. (0.25 Gm.) Novobiocin	35.50 Gm.
121 cap. (0.25 Gm.) Chloramphenicol	30.25 Gm.
93 tab. (0.25 Gm.) Erythromycin	23.25 Gm.
Total	286.20 Gm.

Our exposure to antibiotics is not limited to the prescriptions provided by the medical profession. A considerable portion of the chlortetracycline produced today is added to poultry feed and animal feed, because such agents promote faster growth of the animals. Slaughtered poultry is dipped in chlortetracycline solutions to decrease spoilage. So when you chew into your Christmas turkey you are eating an animal raised on antibiotics and "preserved" by antibiotics. Of course the residual antibiotic in the poultry is supposed to be inactivated by proper cooking but what if your turkey is undercooked? This might easily "cook your goose," if you happen to be allergic to the antibiotic employed.

Milk drinkers may be encountering penicillin unawares.[4] Several surveys, in various parts of the country, have demonstrated penicillin in 5.9 to 23.2% of the commercial milk being sold.[5] The practice of milking the cow, in spite of penicillin having been injected into the udder for mastitis, keeps the cash register jingling happily but is dangerous for the public. Penicillin in milk means penicillin in ice cream and other milk products. If you have missed out so far on getting your antibiotic because you do not like poultry, milk or milk products, then just wait until you get your poliomyelitis vaccine with its dose of penicillin.[6]

(2) *Resistant Strains of Staphylococci.* A dossier on the staphylococcus would disclose:

(a) It is an organism which normally lives in man's nose. Some 50 to 70% of us have coagulase positive staphylococci in our noses at most times.[7] Because man is a nose-picker and sneezer we are constantly transferring the nasal-based staphylococci to our fingers, skin and environment.

(b) The staphylococcus is an organism to which man is moderately well adapted—unlike the plague bacillus to which man is poorly adapted or *N. catarrhalis* to which man is very well adapted, as judged by the pathogenicity of the former and the lack of pathogenicity in the latter. The staphylococcus is ordinarily not in the headlines, as are, for example, the influenza or poliomyelitis viruses. Nevertheless, the staphylococcus is "getting its licks in" and causing frequent minor superficial infections which we usually ignore but they may easily serve as the source for an epidemic of hospital infections.

(c) When it comes to developing resistant strains the staphylococcus is a real thoroughbred. As an example, when erythromycin was introduced into a large hospital as the chief agent in the treatment of infections, the proportion of strains of nasal staphylococci, in hospital personnel, that were resistant to the drug changed from 0 to 75% in a five month period.[8] Many strains of staphylococci found causing infections in hospital patients are now resistant to penicillin, streptomycin, tetracyclines and erythromycin. By knowing what antibiotics are most heavily used in a hospital you can predict to what antibiotic the hospital staphylococci will likely be resistant.

(3) *Deterioration of Hygienic Practices in Hospitals.* Another important factor in our current situation is a false dependency on antibiotics to control infections rather than depending on the well-proved practices of asepsis. We have forgotten about such simple but effective measures in the control of spread of infection as hand washing, careful isolation, care in handling of body discharges, care in cleansing fomites and other good habits. Let me describe some observations from a recent classic along this line, entitled "Bacteriology of the Bedside Carafe."[9] Staphylococci were found in 68.9% of 163 bedside water bottles which were examined from 24 different Boston hospitals. This was strange because the tap water as freshly obtained had enough residual chlorine to be bactericidal. Something was happening to the water at the bedside. The authors noted that at the end of a sip the residual water in the drinking tube drained back into the carafe, carrying saliva; a weak patient making repeated attempts to suck his fill added enough saliva to the water to cause turbidity. Then they found that adding 1% saliva to the tap water provided enough organic matter to quickly inactivate the residual chlorine in the water. In one hospital a nurse emptied the carafe of a patient who had recently died, replaced an adhesive label and left the carafe on the bedside table for the next patient. "Grossly unhygienic conditions were described in two-thirds of the carafes. Dead, partially decomposed insects were frequently seen. The walls of some carafes were slimy; gelatinous islands of algae and fungi floated in others. Most carafes had a stale odor, and a few were literally foul." In all of the hospitals the carafes were supposedly washed daily. In a third of the hospitals the carafes were processed in the same area where bedpans, urinals and basins were cleaned. The ice going into the carafes had an interesting background in many of the hospitals, and offered ease of contamination of the ice by oronasal discharge, dust from clothing and floors, and excreta. Shovels and scoops used to remove ice from machines were dirty. Most stood on the floor when not in use. Some scoops were covered with green algae. In 6 hospitals the ice dispensers were located within splashing distance of the bedpan hoppers. In 3 hospitals bedpans and urinals were parked on the cover of the ice machine while awaiting emptying. One nurse was observed draining a urinal into a laboratory carton perched on the ice dispenser.

An examination of nose cultures for the presence of antibiotic resistant staphylococci in persons in a hospital environment shows that when patients first enter the hospital they usually have a low incidence of such resistant organisms. After being in the hospital for some time the incidence of resistant nasal staphylococci increases.[10] The rate of increase is greater if the patients are receiving antibiotics. On the other hand the hospital personnel will usually show at all times a high incidence of nasal staphylococci which are resistant to antibiotics.[7] One can understand that patients receiving antibiotics, thus hav-

ing their own protective microbial flora destroyed, would be fertile soil for the implanting of antibiotic resistant staphylococci. But why should the hospital personnel be maintaining these resistant staphylococci in their noses? Presumably most of them are not receiving antibiotics. A recent study in England provides the answer to this question.[11] Penicillin was found present in the air and even in the noses of persons in hospitals. The penicillin seemed to be reaching the air mainly from the aerosols resulting from the handling of syringes and vials of penicillin. Penicillin and other antibiotics could also reach the air from topical use of these drugs and the spilling of urine containing the excreted antibiotics. Spilled, dried penicillin could accumulate in the dust and thus again reach the air. To show that this environmental penicillin was important in maintaining the penicillin resistant nasal staphylococci the author made nose cultures of persons who were working in a penicillin factory. These persons, who were exposed to environmental but not administered penicillin, were found to have as high a resistance-rate of nasal staphylococci as had the hospital personnel. These studies have introduced a new concept into our understanding of hospital staphylococci. In addition to the restriction in therapeutic use of antibiotics, the avoidance of contamination of the hospital environment with antibiotics should play a significant role in the control of colonization of hospital personnel and the patients with antibiotic resistant staphylococci.

Seriousness of Current Staphylococcal Infections. In thinking about the problem of staphylococcal infections it is useful to separate the material into two headings: (1) the general population and (2) the hospital population.[12] In the case of the general population there is no evidence that the equilibrium between the staphylococcus and the general population has altered for the worse over the past few years; in fact, the decreased incidence of osteomyelitis and carbuncles suggests that the general public is really better off as far as serious staphylococcal infections are concerned. The hospital population, however, presents a different picture. Many of the patients in hospitals are more susceptible to infection than the average person. Table 3 is a listing of some of the factors which promote susceptibility to infection; such factors are frequently found in hospital patients. In addition to the factors listed a recent article suggests that chlorpromazine may promote susceptibility to infection.[13]

TABLE 3

Some Factors Which Promote Susceptibility to Infection

Age (very young, very old)
Wounds, burns, venous "cut-downs," tracheotomies
Pulmonary edema (congestive heart failure)
Diabetes, collagen diseases, leukemia, hypo- or agammaglobulinemia
Antibiotics (destroy patient's own protective microbial flora)
Adrenal steroids (interfere with patient's defenses against infection)
Etc.

TABLE 4

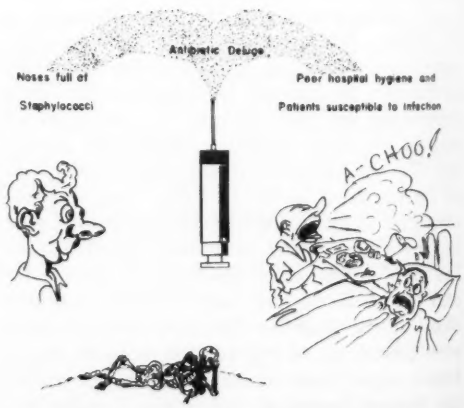
Changing Mortality Rate of Staphylococcal Septicemia, University of Minnesota and Affiliated Hospitals

Years	*Mortality Rate*
1942-1944	28% (1)
1951-1953	54% (2)
1952-1955	80% (3)

(1) Hall, W. H., and Spink, W. W.: Ann. Int. Med. 22:510, 1945.
(2) Wise, R. I. and Spink, W. W.: Bull. Univ. Minn. Hosp. 24:645, 1953.
(3) Spink, W. W.: Ann. New York Acad. Sci. 65:175, 1956.

The worsening mortality rate in cases of staphylococcal septicemia in one area since 1942 is shown in table 4.[14] Twenty-four of the 41 cases occurring since 1952 were in patients who acquired their staphylococcal infections after coming into the hospital. At the Boston City Hospital a spot check of 1,172 patients showed 68 patients with staphylococcal infections present at the time of admission, but 113

FIG. 4



Nasal staphylococci + an antibiotic deluge + poor hospital hygiene = Disaster for susceptible hospital patients.

patients with staphylococcal infections which had been acquired in the hospital.[15] Postoperative wound infections with staphylococci in a thoracic surgery unit in England became so frequent that the unit had to be closed.[16] Routine hospital procedures may be dangerous as indicated by the observation that 7 of 18 fatal hospital-acquired staphylococcal infections were the result of intravenous infusions.[17] The closing of newborn nurseries in several localities because of staphylococcal epidemics has been sufficiently newsworthy to have appeared in your daily papers several times in the past few years. There can be no question about the seriousness of staphylococcal infections for hospital patients in these times.

In summary, the triad of noses full of staphylococci, the deluge of the use of antibiotics and poor hospital hygiene have consorted to spawn the monster known as the hospital staphylococcus (Fig. 4). The chief victims of this chimera are the hospital patients with their increased susceptibility to infection. Since we are unable to do without our noses, the main antidote to the hospital staphylococcus will lie in a discriminating use of antibiotics and a return to good hygienic practices in hospitals.

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The Status of Antibiotics in Surgical Infections*

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The author reviews the development of the antimicrobial drugs and substances. Special consideration is given to their use in surgery and question is raised relative to their prophylactic use in "clean surgery."

HATA[1] IN 1920 and Newfeld and associates,[2] in 1921, independently concluded that an effective antibacterial agent for the treatment of infection which would not be harmful to the human body could not be synthesized or found. The discovery of the antibacterial properties of the azo-dye prontosil by Domagk[3] was soon followed by clinical investigations demonstrating that this product was effective therapeutically in infections caused by the hemolytic streptococcus. The active principal of prontosil, sulfanilamide, was soon isolated and made available for therapeutic use in the treatment of infectious diseases. This was the first of a succession of compounds all derived from sulfanilamide which possessed definite therapeutic antibacterial properties with minimal clinical evidence of toxicity to a patient.

Penicillin discovered by Fleming[4] in 1927, and employed only as a laboratory aid to control coccal overgrowth in the isolation of a specific gram-negative bacillus, waited nearly 10 years for the clinical investigations of Florey and collaborators[5] to demonstrate it as an effective nontoxic antibacterial medication in the treatment of infections caused by gram-positive coccus. Early attempts to isolate penicillin in its pure form was fraught with many difficulties limiting its production to insufficient quantities for the demands made by World War II by the Armed Forces. Welch and Lewis[6] point out that in 1941 the supply of penicillin in the United States was insufficient to treat a single case of infection. As recently as 1942 the treatment of 100 cases of infection with penicillin would have completely exhausted the supply. Necessity being the mother of invention demanded improved methods of production of penicillin in quantity in sufficient amounts for the treatment of casualties of World War II. This was rapidly accomplished by researches of the American Pharmaceutical Houses so that in 1945 and 1946 the supply was not only sufficient to meet the demands of the Armed Services but of the civilian population as well.

The impact of the concept that it was now possible to control infections with an effective antibacterial agent which was not harmful to the human body stimulated endeavors to discover other antibacterial agents which would extend the effective scope of this form of therapy. The isolation of streptomycin by Waksman and collaborators[7] was soon followed by reports demonstrating it as an effective antibacterial agent against species of bacteria not affected by penicillin or the sulfonomides. It was the first of the antibacterial drugs to be even slightly effective against gram-negative bacillus group of microorganisms. However, the control of experimental tuberculosis with streptomycin followed by the clinical demonstration of the control of tuberculosis in human beings remains one of its best antibacterial properties.

In quick succession many different antibiotics were discovered and isolated, studied and made available for the treatment of infection extending the collective antibacterial spectrum of antibiotics so as to exert an inhibiting action against most of the bacteria responsible for the commoner types of infection. In 1949, Johnson, Anker and Meleney[8]

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isolated bacitracin from a strain of Bacillus subtilus recovered from a case of chronic osteomyelitis. This was found to be effective in controlling infections caused by staphylococcus, streptococcus, microaerophilic and other coccal infections. The first of the so-called broad spectrum antibiotics, chlortetracycline (Aureomycin) discovered by Long and Cox[9] possessed an antibacterial spectrum including many gram-negative bacilli as well as many of the coccal type of infections. Chloramphenicol isolated by Ehrlich and co-workers[10] and terramycin first studied by Finley and others were soon found to possess an antibacterial spectrum similar to that of chlortetracycline and therefore classified with it as broad-spectrum antibiotics. It is not the purpose of this paper to review the history and discovery of each of the present-day antibiotics. Brief mention of them referring only to the species of bacteria against which they have been found to be most effective is as follows: neomycin limited by toxic reactions following parenteral administration to oral administration possesses an antibacterial spectrum effective against gram-negative as well as gram-positive bacteria. Erythromycin, ristocetin, novobiocin, oleandomycin and cyclomycin all possess an antibacterial spectrum principally effective against an infection caused by the gram-positive cocci similar to that of penicillin and bacitracin. Most recent of the antibiotics to become available kanamycin possesses an antibacterial spectrum similar to that of streptomycin and neomycin. It is now available for both oral and intramuscular administration.

The tetracyclines marketed under various trade names, with or without buffer complexes have an antibacterial spectrum similar to that of the other broad-spectrum antibiotics. Recently the proportion of erythromycin has been reported to give much higher blood levels with a marked increase in bactericidal properties. It is most effective against the staphylococcus particularly so in regards to penicillin resistant strains. Vancomycin also attains high blood levels but does not demonstrate the same antibacterial power as the proportionate compound of erythromycin. Vancomycin has been very effective against the penicillin resistant staphylococcus.

The present group of available antibiotics has broadened the antibacterial spectrum so as to be of therapeutic value in the preponderance of infections, designated as surgical. The antibacterial spectrum of any specific antibiotic is the effective antibacterial action of that antibiotic against any specie or species of bacteria.

The ever-changing antibacterial spectrum of any antibiotic, the variation of strain sensitivity within a given species to a specific antibiotic and the limited effective antibacterial range of a specific antibiotic is somewhat contradictory to the term "broad-spectrum" in referring to the therapeutic range of a particular antibiotic. The strain sensitivity within a species of bacteria will vary from complete resistance to being very sensitive. Likewise the degree of sensitivity of a specific strain within a species of bacteria will vary between the extremes of sensitivity to one antibiotic and resistance to a different antibiotic with a similar species spectrum. It is therefore obvious that the antibacterial action of any antibiotic against any particular strain is strain specific even when the spectrum of an antibiotic includes many unrelated species of bacteria. It would be advisable to discard the term "broad-spectrum antibiotic" when in reality the only important antibacterial spectrum is the one desired against the specific strain bacteria causing the infection.

Recent sensitivity tests of strains of staphylococcus to the action of penicillin have demonstrated a change in sensitivity from a preponderance of sensitive strains to a preponderance of resistant strains. Sensitivity tests of pathogenic strains of staphylococcus revealed that 90 to 95% of the strains tested were sensitive to penicillin. Within the last decade repeated observations on the sensitivity of staphylococcus to penicillin has shown an alarming decrease in the numbers of sensitive strains, so that at present only 20 to 30% of the strains of staphylococcus now recovered from infectious processes are sensitive to penicillin.

This changing sensitivity of strains of bacteria to the action of antibiotic probably is not limited to penicillin alone. There are reports indicating that this is occuring within the species of bacteria once sensitive to chlortetracycline, terramycin and other tetracyclines. It is hypothesized that it can be anticipated that it will occur with all antibiotics when their popularity has become sufficient

so as to permit a more widely spread and frequent choice.

Many hypotheses, theories and conjectures have been advanced in attempting to explain this changing sensitivity of strains within a species of bacteria to a specific antibiotic. No one theory has satisfactorily explained this phenomena. There are many who adhere to the theory that as antibiotics are employed sensitive strains will be removed from the bacterial population, thus permitting resistant strains to grow more abundantly and to constitute a new bacterial population. Another hypothesis which also lacks confirmation is that the bacteria are capable of a genetic change permitting adaptation to the unfavorable environment of the antibiotic. It is conceivable that both mechanisms are operating coincidentally and that not only is the antibiotic depleting the population of sensitive strains but that some of the more resistant forms are genetically changing so as to develop increasing resistance. It is almost inconceivable that a simple mechanism of depletion is adequate to account for this phenomena and the concept of adaptation will depend upon genetic studies to confirm the theory of adaptation of bacteria to an unfavorable environment.

The early reactions associated with penicillin therapy were first attributed to the impurities in the early batches of material. Purification of penicillin eliminated many of these reactions creating a sense of false security that penicillin was completely devoid of untoward reactions. It was not long, however, before reports of untoward reactions associated with or coincidental to the administration of penicillin became more frequent. For the most part, these reactions were of a minor type, being limited to skin rashes, occasional spikes of fever, local pain, black tongue and local edema of the extremities. The early reports of fatalities associated with penicillin were looked upon with skepticism, and it was not until they became more frequent that careful study confirmed the fact they were definitely attributable to an anaphylactic type of reaction caused by penicillin. Actual incidence of reactions seen in cases receiving penicillin is not definitely known, but varies between 14 and 20%, with serious reactions becoming more frequent.

It was soon found that streptomycin was not only accompanied by minor reactions of little clinical importance but that prolonged continued administration of streptomycin is associated with a rather severe neurotoxic manifestation affecting principally the auditory and vestibular nerves. Bacitracin early in its development was found to possess a rather severe nephrotoxic property manifesting itself by albuminuria, hematuria and an elevation of blood nonprotein nitrogenous products. Purification of bacitracin decreased the incidence and severity of nephrotoxic reactions with the subsequent release of bacitracin for clinical use.

The untoward experiences of toxicity resulting in the suppression of the hematopoietic system by chloramphenicol could not be confirmed. Consequently chloramphenicol was once more released to the medical profession to be used as an effective antibiotic in those cases where it was specific.

The tetracyclines including chlortetracycline and terramycin and other modifications have been associated with nausea, mild diarrhea, febrile reactions and other minor reactions. There have been reports of rather severe and alarming enteric reactions associated with the oral administration of the tetracyclines. It is thought that these enteric reactions are not attributable to a toxic property of the drug and can be attributed to altering antibacterial flora of the large intestines.

Polymyxin, an effective antibiotic against gram-negative bacilli including the Pseudomonas and Proteus bacilli, is associated with a nephrotoxic manifestation similar to that seen with bacitracin. However, for the most part, polymyxin remains an effective antibiotic, preferable administration being topical or local application.

Neomycin is principally restricted to oral administration and local application because of the high incidence of severe toxic reactions accompanying its parenteral administration. Even though many of the newer antibiotics have not been completely evaluated as to toxic manifestations, it is definitely felt that, with an increasing use of these newer antibiotics, reports of toxic manifestation coincident or following their administration will appear. It must at present be concluded that the present armamentarium of antibacterial agents are safe within the limits of their

therapeutic value and that they can be accompanied by toxic manifestations against which the medical profession must be constantly on their guard.

Treatment of Surgical Infections

The need for the existing antibacterial spectrums is well-attested by the development of resistance of specific strains to an antibiotic but does not change the concept of rational antibiotic therapy in surgical infections. The concept of rational antibacterial therapy was clearly outlined shortly after the introduction of penicillin and streptomycin and remains essentially as follows: a patient should not be denied the benefits of antibiotic therapy for an infection pending laboratory analysis of the bacteriology and antibiotic sensitivity tests. The initial selection of an antibiotic will depend entirely upon the clinical characteristics of the infections with the selection of the antibiotic most likely to be effective against the suspected etiology. At the time when the patient receives his first treatment specimens or cultures should be obtained wherever possible. Without delay the specimens should be sent to the laboratory for immediate bacteriologic analysis with indicated antibiotic sensitivity tests. The interpretation of the sensitivity test will act as a guide in the choice of an antibiotic for the therapy. If the antibiotic originally selected is active against the bacteria recovered from the infection, continuation with this antibiotic is justified providing the clinical course supports it. If, on the other hand, the bacterium recovered from the infection is resistant to the antibiotic selected a new antibiotic should be administered, the selection of which depends upon the sensitivity tests which have been determined. In infections which do not respond, repeated cultures with repeated sensitivity tests are mandatory to determine whether or not there is a changing bacteriology or sensitivity to the antibiotic.

Surgical infections can be roughly classified into two groups: (1) those which are present at the time the patient first presents himself to the doctor and for which the patient is seeking medical advice, and (2) those which develop in surgical wounds either traumatic or intentional. The traumatic wounds are those wounds in which contamination is the result of accident without control of contamination or tissue damage. Intentional surgical wounds are made with a deliberate intent for treatment and in which contamination is reduced by adhering to the rules of aseptic technic. Those cases in which excessive contamination is inevitable or inadvertently occurs are classified as clean contaminated wounds. Those surgical wounds in which there has been no unusual or inadvertent contamination are considered clean surgical wounds.

Antibiotic therapy of the infected wound or of a surgical infection continues to be the most effective method of treatment. However, in view of the increasing evidence of resistance of the bacteria to the present armamentarium of antibiotics it is important that other methods be available in the event that the bacteriology of the infection shows it will not support antibacterial therapy. It is unfortunate that methods once employed prior to the advent of antibacterial therapy have not been stressed sufficiently to acquaint developing surgeons with these technics. It is perhaps unfortunate for the training of the young doctor that his training experiences do not include exposure to the treatment of these types of infections as in the pre-antibacterial era. Consequently, the trained surgeon today is not only unfamiliar with previously accepted principles employed in the treatment of surgical infections, but in many instances is unfamiliar with the clinical appearance and differentiating characteristics of overwhelming types of infections in which critical surgical judgment is of utmost importance. The overwhelming infection is only rarely seen because in most instances it is avoided by the early and judicious use of antibacterial therapy limiting most infections to a localized abscess or its complete resolution. The implications of these truths should be self-evident, dictating that once more the training centers should be concerned with teaching methods of treating infections other than by antibiotic therapy. The choice of the antibiotic in these infections has been outlined and should be given by the rational approach of antibacterial treatment.

The prophylactic use of antibacterial drugs in the prevention of infection should be limited to a judicious administration in traumatic wounds and the clean contaminated

case. Prophylactic preparation of the bowel with antibiotics prior to the surgical procedure has been popularized.

Both the sulfonamides of the unabsorbable type and many of the various antibiotics exert an inhibiting action on the bacterial flora of the large bowel. Even though there is a possibility of complete sterilization of the large bowel, in our hands we have not been able to accomplish this, but we have been able to significantly lower and alter the bacterial count and flora of the large bowel. It is of little importance which of the antibacterial agents, the sulfonamides or the antibiotics, is used providing the desired decreased bacterial count and a change in the large intestinal flora is accomplished.

This procedure has permitted operations on the large bowel to be performed without the prolonged convalescence of drainage of the abdominal wound, and has in many instances decreased the incidence of postoperative wound abscess, peritonitis and other complications. However, the necessity of preparing the bowel in this manner has not been definitely established, although it is rapidly becoming established as desirable. There have been complications associated with the altered flora of the large bowel particularly in the form of a very severe enterocolitis. The etiology of this enterocolitis is not known but has been associated with an overgrowth of monilia and of penicillin resistant staphylococci following the decrease in the normal flora of the bowel. Prior to the antibiotic preparation of the bowel there had been reports of series of large bowel surgery in the hands of competent surgeons with a very low incidence of complications due to infection. The implication is that mechanical cleansing of the large bowel prior to operation, through the administration of enemas and the use of laxatives whenever possible, is all that is necessary in the presence of good surgical technic. However, antibacterial cleansing of the large bowel with antibacterial agents does permit large bowel surgery with a higher degree of safety in the hands of many more surgeons and, therefore, probably will prove to be a very distinct benefit in these cases.

In traumatic wounds there is some question as to the advisability of prophylactic antibacterial therapy. The species of microorganisms contaminating these wounds is not known and cannot be determined at the time of the surgical debridement with correction of the trauma; therefore, it makes any choice of antibiotic for prophylaxis of infection one of guesswork. In cases of rather minor trauma such as cuts and wounds by glass without any contusion and with minimal tissue damage, simple debridement within a period of 6 hours should be sufficient, and the prophylactic use of antibacterial therapy in these cases should not be required. A study made on the prophylactic administration of the sulfonamides, in 1942, showed there was no difference in the incidence of infection in the cases when the sulfonamides were used prophylactically as compared to the cases in which no such antibacterial therapy was used. In those cases in which the trauma has occurred 6 hours or more prior to surgical intervention, the wound changes from a clean contaminated wound to a potentially infected, if not an infected wound. In these instances a broad-spectrum antibiotic judiciously used probably may decrease the incidence of infection, but cultures should be taken at the time of the surgical procedure to determine any change as indicated by the analysis in the already infected wound. Antibacterial therapy should follow the rationale outlined for the treatment of the infected surgical case.

The actual incidence of infection in clean operative wounds is not definitely established and probably will vary from one hospital to another. In 1936, Meleney[11] reported that the results of a ten year study of infection in clean operative cases with an incidence of infection as low as 2% in the later years of observation.

Recent reports of similar studies covering shorter periods of time and without suitable controls indicate that there has been a progressive increase in the incidence of wound infection in clean surgical procedures. Howe has reported an incidence of about 4%, which represented a progressive increase over the period of 5 years covered in the study.

The etiology of infection in these cases has for the most part been clearly established to be *Staphy. aureus, hemolytic.* Meleney[11] found *Staphy. aureus* in pure culture in 65 to 70% of infected operative wounds, and existing coincidental with other bacteria in an additional 10 to 15%, making the total

percentage of infections containing staphylococci approximately 80 to 85 percent. Howe, in his study found the staphylococcus in pure culture in approximately 80 to 85%, and existing coincidental to other bacterial infections in an additional 15%, staphylococci thus being present in approximately 90 to 95% of all infections in clean operative wounds. There has never been any doubt that the staphylococcus probably is the most serious and frequent cause of surgical infection.

The significance of this increasing wound infection with an increasing frequency of *Staphy. aureus* in the infection is very suggestive that contamination with this organism is probably more frequent than in previous studies. Actually, there is no conclusive evidence that this contamination is occuring more frequently. It is possible that the contaminating staphylococcus is of a more virulent or pathogenic strain and thus potentially more infective. Coincidental with this increase in wound infection with staphylococci has been the development and appearance of other staphylococcal infections, such as staphylococcal pneumonia seen on the pediatric and newborn services and the geriatrics services. Phage typing and antibiotic sensitivity tests indicate that we are dealing with strains differing from those formerly recovered from these infections. At present the resistant strains compose approximately 70 to 75% of all recovered staphylococci, only 20 to 25% of them being sensitive to penicillin. Similar penicillin resistant strains of staphylococci are being recovered from the respiratory passages in a very high percentage of the hospital personnel, including those in the operating room.

With this information it is reasonable to conclude that the opportunity for contamination with staphylococcus has definitely increased. However, this does not necessarily mean nor does it necessarily follow that the amount of the contaminating inoculation has varied in the least way. If the inoculation with these resistant forms of staphylococcus is not greater than it was in previous observations, it is reasonable to assume that the present strains of staphylococci are able to resist the normal defenses of the body and establish themselves as an infection. On the other hand it is conceivable that the inoculation may be larger and thus the infection is more imminent, particularly so when antibiotics are not effective against them.

The question of prophylactic antibiotic therapy in clean surgical cases still remains as prior to the appearance or development of these antibiotic resistant strains of bacteria. In the early phases of antibacterial therapy this was studied, and the conclusion reached by many investigators was that there is little justification to protect clean surgical cases produced under rigid aseptic technic by antibiotics or other antibacterial agents. Even though the prophylactic use in these wounds is wide-spread, there is no evidence that it has exerted any beneficial influence in the course of wound healing in these cases. Before administering antibiotics prophylactically in clean surgical cases one should stop and ask just which antibiotic is the one of choice. The logical answer would be a wide spectrum antibiotic to offer the greatest likelihood of including the possible species and strains of bacteria contaminating such wounds. However, since it has been shown that even these wide spectrum antibiotics are strain-specific, it leaves no assurance that the strains of bacteria contaminating the wounds will be sensitive to the antibiotic selected. Prophylactic antibiotic therapy in these cases is definitely to be condemned for several reasons. (1) It is impossible to select an effective antibiotic other than by pure chance. (2) It tends to permit a laxity in adherring to rigid aseptic technic hoping to secure the protection for the wound by ineffectual antibacterial therapy. (3) It is now generally concluded that repeated exposures of strains of bacteria and species of bacteria to antibiotics encourages and probably fosters the development of resistant strains in a higher percentage than would be present if this had not been practiced. (4) Antibacterial therapy is, as the term implies, an adjunct to surgery or medicine in the treatment of infection and not necessarily a prophylaxis against infection.

The prevention of infection in any surgical case must depend upon adherence to the rigid aseptic technic as outlined by many investigators and practiced in most hospitals today. Any deviation from this technic due to the development of ineffectual aids, or

discovery of newer antibacterial agents is to be condemned. Rigid aseptic technic will not prevent contamination alone, but will decrease the size of the inoculum or will minimize a contaminating risk. Inasmuch as all wounds are contaminated, regardless of the rigidity of the aseptic technic followed, it must be accepted that other factors contribute to the low incidence of infection in these cases. One of the major factors concerned in contributing to the low incidence of infection is the development of technics which will permit primary wound healing without complication favoring infection. All surgeons must be taught technic compatible with clean wound healing and with the prevention of contamination of these wounds if control of wound infection is to be expected; prophylactic antibacterial therapy has failed in this regard.

In *conclusion,* there is little doubt that the advent of antibacterial therapy has proven one of the biggest advances in the treatment of infection since the time of Lister. Successful antibacterial therapy will depend upon successful analysis of the discharges of infection determining the bacteria responsible for the infection and then determining the sensitivity of these bacteria to the antibiotics. The antibiotic which is most effective against any specific strain of bacteria is the one of choice. Prophylactic antibacterial therapy in clean operative cases is to be condemned and should be completely discouraged. Prophylactic antibacterial therapy in the clean contaminated wound has been discussed and under certain conditions might be considered acceptable therapy in these cases. The prevention of wound infection in clean surgical cases as well as in the clean contaminated cases must be dependent upon rigid adherence to aseptic technic with the practice of the principles of surgery compatible with those laid down for clean wound healing.

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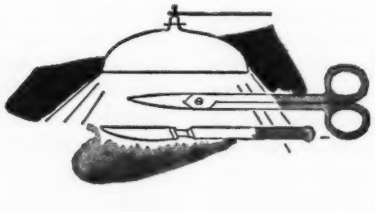

X-ray Treatment of Hemangiomas:

A Review of 500 Cases and 15 Years Experience*

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Because there is much disagreement with respect to the treatment of hemangiomas, the author's experiences with a large series of patients treated by the x-ray is of particular value.

LACK OF UNANIMITY exists among authorities regarding the nature and treatment of angiomas. Each specialty group having to deal with these lesions tends to have its own opinion, with consequent disagreement concerning classification, treatment and results. I believe most of these vascular growths require treatment and that the therapy indicated varies with the type of lesion, its individual features and the location of the lesion as well as the age of the patient.[1] Among the most commonly used methods of treatment are the following: (1) carbon dioxide snow, (2) surgical excision, (3) roentgen therapy, (4) radium therapy, (5) thorium-X therapy, (6) injection of sclerosing solutions, (7) ultraviolet radiation therapy, (8) electrocoagulation, (9) tattooing, and (10) cosmetic disguise.[2]

Treatment

The matter of the spontaneous regression of angiomas has been raised on many occasions. Lister,[3] and Ronchese[4] believe that observations have definitely established their contention that the majority of angiomas will regress considerably or disappear completely if left untreated. If spontaneous regression of these lesions occurred invariably, the course to be taken would be obvious. Unfortunately, however, this is not always the case, and there are many reports that spontaneous regression has not occurred in some children past the age of 10 years.

When one sees such lesions in individuals between the ages of 10 and 20 years he naturally wishes to treat all these lesions at an early age. Mullins[5] recently stated he had seen 6 patients, aged 10 to 40 years, who had hemangiomas which would have been amenable to early treatment. It is characteristic of many such lesions to begin to increase in size from the time of birth, or immediately thereafter. This growth may persist to the end of the first year, although most often it ceases by the end of the sixth month. Early in their course it is impossible to predict the degree of growth or the consequent destruction of normal tissue that will result. Large lesions, especially when situated near the eye, the nose and ears, may become complicated, as by trauma followed by severe secondary infection to result in marked disfigurement. Accordingly, it appears to be highly illogical to adopt a "wait and see" attitude, as has been proposed by some. Moreover, noninterventionists are at times impelled to begin therapy by the parents of an afflicted child because of fears induced by progression of such a lesion.

The chief danger in managing hemangiomas arises not from any attribute of the disease but rather from overzealous therapy. Surgical excisions and plastic rearrangements often will leave cosmetic blemishes which would not have followed conservative management. Overly enthusiastic radiation treatment of any kind, while effecting rapid and complete regression, will produce overt or latent radiation damage of tissues. Years later skin changes and limitation of bone growth may become apparent. The objective of treatment must not be the disappearance of the lesion followed by apparently normal tissue at the site several years after treatment, but must be the presence of undamaged normal tissue decades later. The use of sclerosing agents at times results in an untoward slough

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of tissue and subsequent scarring. Overtreatment with carbon dioxide snow will scar the skin, and at the same time a subcutaneous component may continue to grow.[6]

Juhl and Pohle[7] conclude there are certain large lesions which lend themselves to roentgen therapy because of their size and location. It is possible to get more even distribution of roentgen rays than of beta and gamma rays of radium when the latter is applied in the form of small plaques. The use of x-ray therapy eliminates the irregularity and blotchiness which may follow the uneven irradiation by radium when it is used on large irregular areas which require several applications to treat the entire vascular tumor. It also eliminates the possibility of overlapping in some cases. From experimental and clinical evidence one may deduce that the biologic effects of x-ray and radium are identical for equal amounts of radiant energy absorbed. Consequently it is not surprising that good results may be obtained by the proper use of roentgen rays.

Andrews[8] has pointed out that the erythema dose which is obsolete in the treatment of cancer is important in the treatment of hemangiomas and some other cutaneous diseases. To obtain a good cosmetic result the aim should be to avoid local cutaneous reaction. The aim is to cause the disappearance of the angioma while causing the least possible injury to the skin.

Results of Treatment

Clinically the hemangiomas encountered in infants below the age of one year may be divided into 4 main types: (1) capillary hemangioma, nevus inflammeus, or port-wine mark; (2) hypertrophic hemangioma, nevus vascularis, or strawberry mark; (3) cavernous hemangioma; and (4) mixed combination of the cavernous and hypertrophic types.

Port-wine marks are best treated by thorium-X[9] or tattooing.[10] None of the patients reported in this series had the port-wine type of angioma and from previous reports this type of lesion would not respond satisfactorily to the recommended x-ray dosage for hemangiomas.

The results in 500 patients treated between 1941 and 1957 are reported herein. The first 200 patients were treated between 1941 and 1952; the remaining patients were treated between 1952 and 1957. The age at which treatment was started and the number of patients treated at various ages is shown in tables 1, 2 and 3.

The unfiltered roentgen rays used were given at 50, 62 and 85 kv., depending on the thickness of the angioma. All treatment with the exception of that of 6 patients was given at a target distance of 15 cm. (in the 6 patients with deep angiomas the target distance was 24 cm.). The therapy units used for this treatment were of the superficial type having an inherent filtration equivalent to 0.5 mm. of aluminum.

The dose per treatment, total average dosage, treatment interval and the age groups are shown in tables 4 and 5.

Involution of the hemangioma began first in the center of the lesion, and the younger the patient the less therapy was required to produce this change. When involution was observed after the first or second treatment only 3 treatments were given. However, in older infants (over 6 months of age) 5 treatments were usually required for the infants included in table 4 and 4 for those in table 5, and involution took place much more slowly.

In all cases I informed the parents of the natural course of the disease and that my

TABLE 1

200 PATIENTS TREATED BETWEEN 1941 AND 1952

Number of Patients	*Percentage*	*Age at Which Treatment Was Begun*
48	24	Before 5 wks.
118	58	Before 7 mos.
36	18	Before 13 mos.

TABLE 2

300 PATIENTS TREATED BETWEEN 1952 AND 1957

Number of Patients	*Percentage*	*Age at Which Treatment Was Begun*
66	22	Before 5 wks.
186	62	Before 7 mos.
48	16	Before 13 mos.

TABLE 3

500 PATIENTS TREATED BETWEEN 1941 AND 1957

Number of Patients	*Percentage*	*Age at Which Treatment Was Begun*
114	22.8	Before 5 wks.
302	60.4	Before 7 mos.
84	16.8	Before 13 mos.

TABLE 4

DOSAGE
200 PATIENTS TREATED BETWEEN 1941 AND 1952

Per Treatment	*Total*	*Treatment Interval*	*Age Group*
175 r.	525-700 r.	1 wk.	Before 5 wks.
200 r.	800-1,000 r.	3 wks.	After 5 wks.

All treatment unfiltered.

objective is eventual total regression without late undesirable sequelae. Color transparencies are made and accurate descriptions and dimensions are recorded in all instances. I also tell them of the differences in opinion regarding the treatment of these lesions, fortifying myself against critical comments by relatives and friends. Color transparencies have a special value. Parents find it difficult to appreciate the gradual and subtle retrogression, and after one or two years they frequently are amazed at the change which has occurred and which is evident on comparison with color transparencies showing the initial appearance.

In all cases, once involution has begun, periodic observation becomes important only for reassurance of the parents, if they require it, and for academic interest in accumulating data. Periodic observation is, however, imperative until obvious regression has begun, to make completely certain that the initial identification of the lesion as one which will regress was correct. In all the cases illustrated by the photographs shown, most improvement (essentially 90%) was noted after all roentgen therapy had been completed.

In the first 200 patients treated, involution was complete, in those infants treated before the age of 5 weeks, at the end of 2 years. In those treated after this time complete healing was not noted before 2½ to 3½ years of age. From the experience gained in the treatment of this group of patients, it was my belief that the earlier some involution was obtained the less the total x-ray dosage would be required. With this thought in mind I have made a slight increase in the individual treatment dose given to the last 300 patients recorded in this series. While 240 r. was the highest individual dose given to these infants, a distinct erythema could be noticed in about one-third of the patients in the exposed area about 10 days after therapy was given. Even in the infants over 5 weeks of age definite involution could be noted in the average case following the second treatment. Ninety-six patients have been followed for a period of 3 years, and the average involution time in this group is 2 years. This would seem to indicate that the healing time has been reduced in addition to reducing the total average dosage per lesion as a result of giving a slightly higher individual treatment dose. The course of 20 of these patients has been followed for 5 years and there is no evidence of tissue damage, loss of hair in the area, or loss of function of the sweat glands in the treated area.

TABLE 5

DOSAGE
300 PATIENTS TREATED BETWEEN 1952 AND 1957

Per Treatment	*Total*	*Treatment Interval*	*Age Group*
200 r.	400-600 r.	2 wks.	Before 5 wks.
240 r.	720-960 r.	3 wks.	After 5 wks.

All treatment unfiltered.

Only 4 patients, less than 1%, developed secondary infection after treatment was begun. In these cases the infection was mild and readily controlled by antibiotics and the roentgen therapy. However, 76 patients (15%) did not begin treatment until moderately advanced secondary infection had already appeared; in these patients a poorer cosmetic result was obtained because of extensive tissue destruction by ulceration. Such ulcerated hemangiomas may not be treated so satisfactorily with carbon dioxide snow, sclerosing solutions, or a small plaque of radium as they are with roentgen therapy, which includes the entire lesion at each treatment and aids in reducing the infection as well as removing the lesion.

Summary

A review of 500 infants treated for hemangiomas with low voltage roentgen therapy is presented.

Many of these patients have been followed for a 15 year period and no evidence of tissue damage, bone destruction, or destruction of other features has resulted from this treatment.

One should not adopt a "wait and see" attitude because such a policy may result in trauma followed by infection, ulceration, pronounced scarring, and disfigurement.

The well-trained dermatologist is equipped

and qualified to treat the average hemangioma, except those requiring extensive surgery, by the method of his choice for the particular lesion.

The patients presented herein were treated with equipment which is found in the average dermatologist's office.

In treatment of all the angiomas one should consistently bear in mind that it is imperative to remove the lesion with the least cosmetic defect. In no instance should one be hasty in carrying out therapy which may damage underlying tissues. It is wiser that the lesion be removed slowly rendering a superior cosmetic result.

Low voltage x-ray therapy given in conservative dosage is an effective means of treating many of the hemangiomas, and the results shown by using this method indicates that this procedure gives excellent therapeutic and cosmetic results.

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Discussion (Abstract)

Dr. David G. Welton, Charlotte, N. C. Dr. Wilson has presented us today with an outstanding contribution to the clinical evidence which bears on this important problem. The management of hemangiomas in infants and children is a subject about which little agreement exists and this situation may prevail for some time. Reports such as Dr. Wilson's, however, provide considerable help to all who deal with this problem frequently.

Our inability to predict accurately the capacity for spontaneous involution, or the lack of it, in each individual lesion is the chief reason for the basic disagreement about the management of hemangiomas. It is this inability, recognized by all, which justifies therapy in many cases; but at the same time there *is* general agreement that this therapy should be tempered with *frequent* check-up visits because overtreatment is perhaps the biggest hazard of all. Dr. Wilson has emphasized this very point in his paper. "Normal involution" may be stimulated by judicious therapy, conservatively administered. Certainly none can logically disagree with the objective he stated, " . . . not just the disappearance of the lesion, leaving apparently normal tissue at the site *several years after* treatment, but the presence of *undamaged normal tissue* decades later."

Actually an Englishman should have been asked to open the discussion on this subject. I am thinking of one William Shakespeare; I imagine he would begin something like this:

"To treat, or not to treat, that is the question:
Whether 'tis nobler in the mind to suffer
The slings and arrows of watchful waiting,
Or to take arms against a mass of blood vessels
And by opposing end them."

The problem of spontaneous regression is almost a passion with some of our colleagues both in dermatology and pediatrics. Dr. Wilson's experience emphasizes the fact that all hemangiomas do *not* disappear spontaneously. We are reminded that some may penetrate deeply, invading and destroying normal underlying structures and leading to severe disfigurement. We know also that certain cavernous hemangiomas, particularly those involving the nose or ear for example, accelerate the growth of that structure and may produce gross deformity. This fact provides an additional indication for therapy of some kind,—to arrest abnormal growth.

Dr. Wilson has presented a most imposing series of cases in which he has achieved excellent clinical results with virtually no ill effects. This is a remarkable accomplishment and brings to mind Dr. George Andrews' statement that in 30 years he did not observe a single case of arrested bony development resulting from irradiation of hemangiomas.

I shall not go into detail with respect to the technical considerations, but I believe that the use of 1 mm. aluminum filtration would prevent the erythema dose which Dr. Wilson encounters. In our experience a dose of 150 to 200 r. filtered through 1 mm. Al. has been quite satisfactory. Another reason for using some filtration is that in many cases the superficial hemangioma has an underlying cavernous component which would be more successfully checked. I have on several occasions seen this underlying component enlarge very rapidly, in a matter of a few weeks, which frightens both the parents and the physician.

I am unable to detect much difference between the use of 50 and 62 kv. and would like Dr. Wilson to amplify that point.

My own preference is to give treatments farther apart, waiting for a period of longer than 4 weeks for evaluation of involution. I would hesitate to use 250 r. once a week for three or four weeks under age several months; but Dr. Wilson's experience indicates that that dosage *is* safe and produces a better final result.

Finally, realizing that Dr. Wilson speaks from an experience with an unusually large series of cases in private practice, we should congratulate him upon his clinical accomplishments and upon this outstanding report.

Cancer Cells in the Circulating Blood*

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Studies of this type may eventually cast light upon aspects of the pathologic physiology of malignant growths.

Introduction

THE SPREAD OF CANCER from the primary site to distant foci is well recognized and presents one of the most serious problems in the management of clinical cancer. An abundance of both autopsy and surgical evidence attests to the dissemination of cancer cells by way of the vascular and lymphatic systems. Nearly one hundred years ago Ashworth[1] reported, "cells similar to those in the tumor were seen in the blood after death." Nevertheless, the physiopathology of metastasis is not completely understood and only in the last 3 to 4 years has an intensive and systematic study of circulating cancer cells in patients been made.[2-5]

Cancer cells gaining access to the vascular system are either destroyed or become established in a new location. Possibly host factors are entirely responsible for the fate of the circulating cells. On the other hand, either the quality or quantity of the cancer cells themselves may be most important. Consequently, the present study was undertaken to evaluate cancer cells in the blood in relation to certain aspects of the clinical status of the patients. The following is a preliminary report on the data obtained from a cytologic examination of a number of blood specimens from cancer patients.

Materials and Methods

Clinical Material. Twenty milliliters of of blood were collected from the antecubital vein of patients with a variety of types of cancer. In addition, 10 ml. of blood were drawn from the local vein draining the tumor in those cases where an operation was performed.

Laboratory Method. The blood specimens were prepared for cytologic examination by the Streptolysin 0 technic.[6] Briefly, this procedure consisted of separation of the plasma from the heparinized blood by centrifugation. The packed cellular elements were then washed twice by centrifugation in 0.85% saline. The erythrocytes and leukocytes were lysed by incubation with Streptolysin 0, an enzyme of the streptococcus. The resultant preparation was filtered through a millipore filter with a pore size of 5 microns.[7] Six filters were used for 20 ml. of blood.

As an alternative 0.85% saline may be added to the hemolyzed specimen before filtration. Another variation is centrifugation of the hemolyzed specimen in the presence of 0.7% polyvinylpyrrolidone or 0.25% glycerin following which the pellet is resuspended in 0.85% saline and filtered. Either of the alternatives gives satisfactory results. They do not, however, have any marked advantage and their inclusion is time consuming. The filters were then fixed in modified Carnoy's fixative[8] stained by the Papanicolaou technic and mounted in Permount. The slides were examined under the microscope at 150X magnification. The usual cytologic criteria of malignancy were used in identifying the neoplastic cells;—namely, nuclear enlargement, hyperchromatism, prominent nucleoli and staining reaction.

Results and Discussion

Previous studies have shown that no loss of cancer cells occurs when specimens are prepared by the Streptolysin 0 technic.[6] Further, the removal of a large part of the cellular material in whole blood by this method leaves the cancer cells morphologically intact on an easily screenable field. The relatively large amount of blood that can be handled by this method is also an advantage.

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†From the Pathologic Anatomy and the Surgery Branches of the National Cancer Institute, National Institutes of Health, Public Health Service, U. S. Department of Health, Education, and Welfare, Bethesda, Md.

TABLE 1

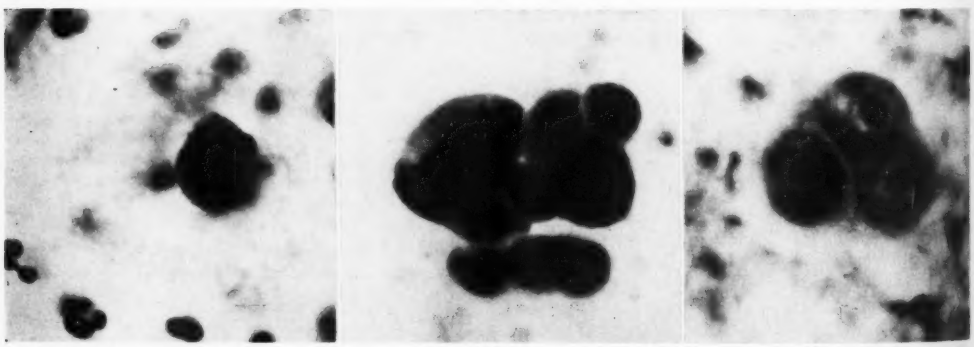
FINDINGS IN PERIPHERAL BLOOD OF PATIENTS WITH CANCER

Type of Cancer	*No. of Cases*	*No. of Cases Positive*	*Per Cent of Cases Positive*	*No. of Specimens*	*No. of Specimens Positive*	*Per Cent of Specimens Positive*
Carcinoid	1	1	100	1	1	100
Testis	1	1	100	1	1	100
Osteogenic	2	2	100	3	3	100
Endometrial	1	1	100	2	1	50
Breast	13	5	39	26	10	39
Nasopharynx	3	1	33	3	1	33
Oral cavity	7	2	29	7	2	29
Cervix	7	2	29	7	2	29
Connective tissue	12	4	20	19	5	26
Adrenal	3	1	33	4	1	25
Melanoma	17	5	29	25	5	20
Colon	3	1	33	4	1	20
Choriocarcinoma	16	4	25	35	7	20
Site unknown	6	1	17	6	1	17
Kidney	7	2	29	13	2	16
Thyroid	4	1	25	7	1	14
Salivary gland	1	0	0	1	0	0
Lung	4	0	0	5	0	0
Stomach	3	0	0	5	0	0
Rectum	4	0	0	4	0	0
Ovary	1	0	0	1	0	0
Bladder	3	0	0	3	0	0
Rhabdomyosarcoma	1	0	0	1	0	0
Teratoma testis	1	0	0	1	0	0
Total	121	34	28	183	44	24
Specimens per case	1.5					

Our purpose in initiating the present study was to survey a number of patients with various types of cancer to establish a background of information for comparing and, if possible, correlating the blood findings with the clinical status.

Table 1 summarizes the work to date. One hundred and eighty-three specimens of peripheral blood from 121 patients have been examined. Obviously, this number is not sufficient to justify any firm conclusions but a trend can perhaps be noted. Dealing only with the cancer types in which there are enough cases to warrant analysis, i.e., 13 cases of breast carcinoma, 17 cases of melanoma, 16 cases of choriocarcinoma, and 12 cases of connective tissue sarcoma, the per cent having demonstrable circulating cells in the blood ranges from 20 to 39% positive, as compared with an average of 28% positive for the whole

FIG. 1



A B C

(A) Cells found in the peripheral blood of a case of renal cell carcinoma. (1360 x Papanicolaou stain) (B) Cells found in the peripheral blood of a case of choriocarcinoma. (1240 x Papanicolaou stain) (C) Cells found in the local blood of a case of melanoma. (1240 x Papanicolaou stain)

TABLE 2

RESULTS OF SUBSEQUENT EXAMINATION OF PERIPHERAL BLOOD FROM THE SAME PATIENTS

	Positive			*Suspicious*			*Negative*		
1st Screening 119 patients		29 (24%)			10 (8%)			80 (68%)	
2nd Screening		14 (50%)			6 (60%)			19 (22%)	
	Pos.	Susp.	Neg.	Pos.	Susp.	Neg.	Pos.	Susp.	Neg.
	5 (36%)	1 (7%)	8 (51%)	1 (17%)	0 (0%)	5 (83%)	3 (16%)	1 (5%)	15 (79%)

series. It will be interesting to observe whether or not this ratio will be maintained when additional cases of other tumor types are studied.

Perhaps of greater significance are the relatively few positive cytologic findings among patients with cancer of the kidney, thyroid, lung, and sites unknown, since the histologic evidence of vascular invasion is known to be high in these groups, suggesting that at some point the cancer cells were blood borne.

TABLE 3

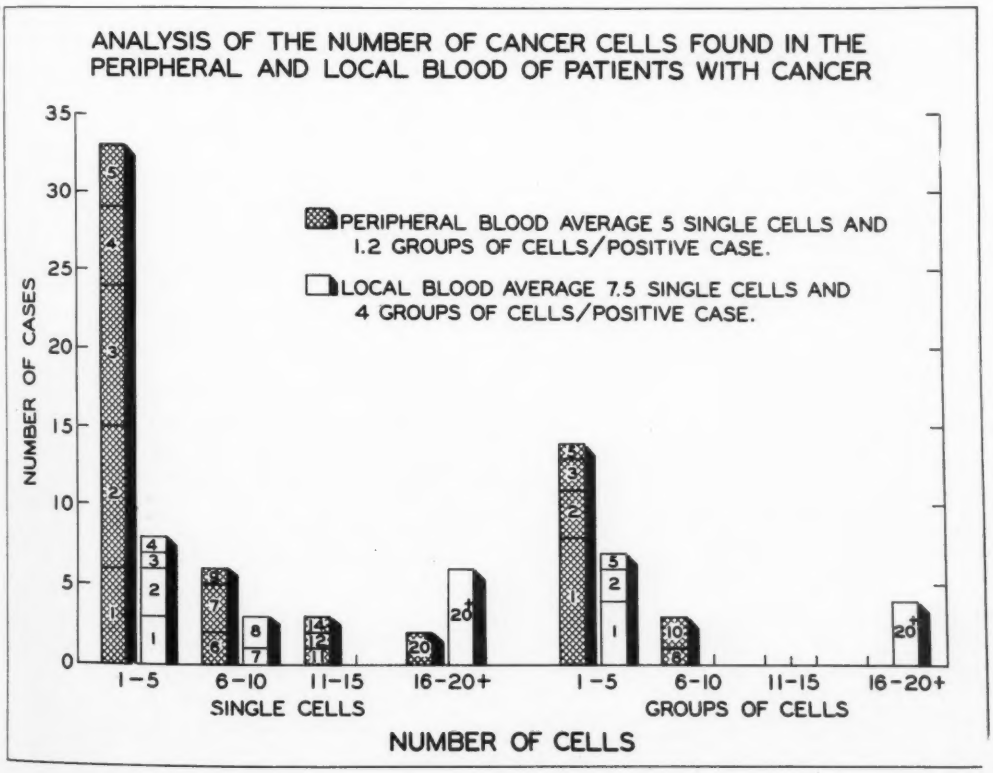
RESULTS OF LOCAL VENOUS BLOODS STUDIED

No. of Specimens	*No. Positive*	*No. Suspicious*	*No. Negative*
38	21 (55%)	7 (18%)	10 (27%)

Figure 1 shows typical instances of choriocarcinoma, renal cell carcinoma and melanoma, illustrating the material on which the cytologic evaluations were based.

In another analysis, the first screening of 119 cancer patients showed 29 cases (24%) positive, 10 cases (8%) suspicious, and 80

FIG. 2



cases (68%) negative, (Table 2). When 14 of these 29 positive cases were screened a second time, 5 (or 36%) were found to have cells in the peripheral blood. One (17%) of the 6 suspicious cases rescreened was positive and circulating cancer cells were detected in 3 (16%) of the 19 negative cases rescreened. A third screening just begun tends to substantiate these ratios. Although the chances of finding circulating tumor cells is higher if the first specimen is positive than if it is suspicious or negative, their presence in subsequent examinations is not a certainty.

Others have observed that the percentage of blood specimens containing tumor cells is higher in samples taken from the vein draining the tumor than it is in peripheral blood.[2,4] The present study corroborates this. As shown in table 3, 55% of the local blood specimens were positive, as compared with 24% positive in peripheral blood.

An analysis of the numbers of cancer cells found in the peripheral and local blood of patients with cancer is illustrated in figure 2. The average number of single cells found in the positive peripheral blood was 5 and in the local 7.5. An average of 1.2 groups of cells were found in the positive peripheral blood specimens as compared with 4 groups of cells per positive local blood. The local blood samples are, therefore, not only more often positive but have more single and groups of cancer cells than do the peripheral blood specimens.

The relationship of the circulating cancer cells to the ultimate course of the disease in a particular patient cannot be evaluated at this time. However, it is interesting to note that in several cases metastases were present in patients with negative blood specimens. In other patients large numbers of cancer cells were found in the blood but there was no clinical evidence of metastasis. In some cases these cells were in groups and appeared cytologically quite undifferentiated.

With additional study it is hoped that it may be possible to gain more basic knowledge of the factors involved in the process of metastasis.

Summary

A preliminary report on the data obtained by cytologic examination of the peripheral and local blood specimens from cancer patients has been presented. Cancer cells are found more frequently and are more numerous in local than peripheral blood. These cells are more often present in the peripheral blood of a patient in whom cancer cells had previously been found than in patients in whom no cancer cells had been observed on previous examination.

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Subpulmonary Pleural Effusions

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The smaller amounts of pleural effusion may remain subpulmonary and the costophrenic sinus may remain clear. Films made with the patient in the lateral decubitus may demonstrate such fluid to be free in the pleural space.

THE COMMONLY ACCEPTED EARLIEST SIGNS of free pleural effusion are an obliteration of the costophrenic sinus, some flattening of the dome of the diaphragm and loss of detail at the base of the lung on the affected side. With only these signs, however, pleural thickening or adhesions cannot be excluded.Until the appearance of a moderately dense shadow at the base of the lungs, usually high on the lateral side or extending along the periphery as a ribbon-like shadow, the diagnosis of pleural effusion is not at all certain.[1]

In general, before any of these signs occur, there must be a filling of the posterior and frequently also of the anterior pleural sinus which lies below the level of the dome of the diaphragm. Here the fluid first accumulates and tends to remain when the patient is in the usual upright position. It is known that as much as 300 cc. of normal saline have been injected into the pleural cavity of an adult with no shadow being obtained in the lateral costophrenic sinus on the roentgenogram in the routine erect position.[2] When a massive effusion is present, the entire hemithorax is dense with no alteration in appearance with change of position.

In a few cases, the fluid shadow is somewhat convex and leads to the mistaken diagnosis of elevation of the diaphragm or possibly of subphrenic abscess.[3] There may be some density above it suggestive of fluid, but the most striking finding is the convex shadow over the diaphragm. This type of fluid distribution within a chest is known as subpulmonary pleural effusion or supradiaphragmatic pleural effusion. Perhaps the most useful procedure in diagnosing a subpulmonary pleural effusion is the use of roentgenograms in a decubitus position, this technic apparently first having been described by Rigler, in 1931. All pleural transudates and most pleural exudates appear to shift markedly when the position of the patient is changed.[4] Pleural exudates of purulent type and nonpurulent exudates which have been present sufficiently long to develop adhesions may not change in position even when the patient is inverted.

The last 100 cases of pleural effusion seen at the Mississippi Baptist Hospital have been reviewed, and it was found that 8 out of the 100 or 8% of the cases presented as a pure subpulmonary collection, that is, the upper surface of the fluid was convex with a clear sinus. Eight additional cases were predominantly of this form, although there was very slight blunting of the costophrenic sinus, making one suspicious of a small accumulation of fluid. Films in the decubitus position in this group served the double purpose of verifying the presence of fluid in the questionable case, and, in addition, usually indicating the presence of a much larger volume of fluid than was anticipated from viewing chest films made in the routine erect position. Thus 16% of the last 100 cases seen were predominantly of the subpulmonary type.

The following are presented as examples:

Case 1. Mrs. D. M. C., a 32 year old white woman, was admitted to Mississippi Baptist Hospital on Oct. 9, 1957, following an examination in a physician's office which showed what appeared to be an elevated right diaphragm. Her health had been good until about 2 weeks prior to admission, at which time she had begun to have pain in the right shoulder with soreness in the right lower chest and pain upon deep inspiration.

A film of the chest made in the erect position in the hospital on Oct. 9, 1957, showed a density at the right base which had a convex upper surface (Fig. 1). A film in he right lateral decubitus revealed that this represented fluid which moved freely throughout the pleural space with the right leaf of the diaphragm

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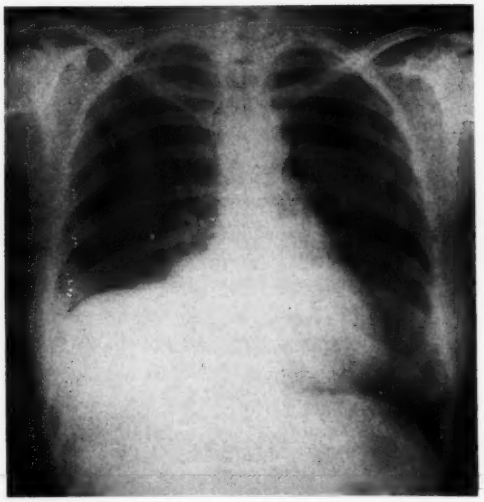
FIG. 1



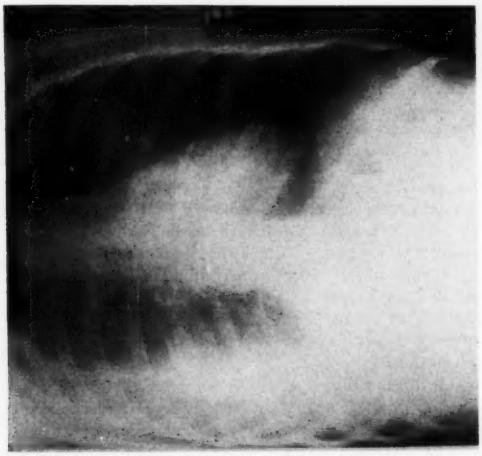
(Case 1) This PA chest film shows a pure collection of pleural fluid on the right side with a clear costophrenic angle. The convex fluid shadow simulates an elevated right diaphragm leaf.

being in its normal position (Fig. 2). Subsequent examination and operation proved that this patient had undifferentiated adenocarcinoma of the stomach, the effusion being on a metastatic basis.

Case 2. C. S., a 9 year old white boy, was admitted to the Mississippi Baptist Hospital on Sept. 5, 1958, with complaints of low-grade fever, diarrhea, and intermittent vomiting for about 2 weeks prior to admission.

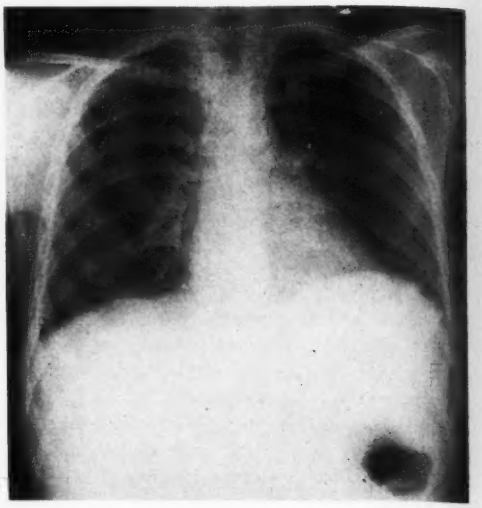
Physical examination showed that the abdomen was somewhat distended, with generalized tenderness most

FIG. 2



(Case 1) This right lateral decubitus film shows a surprisingly large collection of fluid in the right pleural space with the diaphragm leaf being at a normal location.

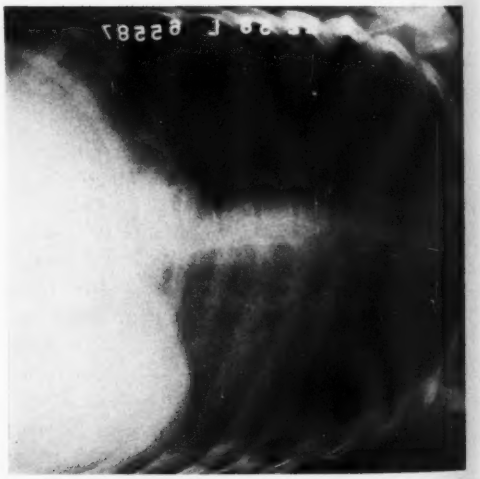
FIG. 3



(Case 2) There was no reason to suspect any pleural fluid in this case clinically, but the very slight elevation of the left leaf of the diaphragm was noted. The stomach bubble was not outlined well enough to be of aid.

marked in the right lower quadrant. The clinical diagnosis was gastroenteritis, cause undetermined. Because of persistent symptoms, particularly fever and abdominal tenderness, an upper G.I. series and barium enema were performed, both of which showed no abnormalities. A postero-anterior film of the chest did not show any definite abnormalities although it was noted that the left leaf of the diaphragm was slightly higher than average (Fig. 3). A subsequent film made in lateral decubitus showed there was a small but

FIG. 4



(Case 2) A left lateral decubitus film showed a small collection of fluid free in the pleural space. There is a normal position to the left diaphragm leaf.

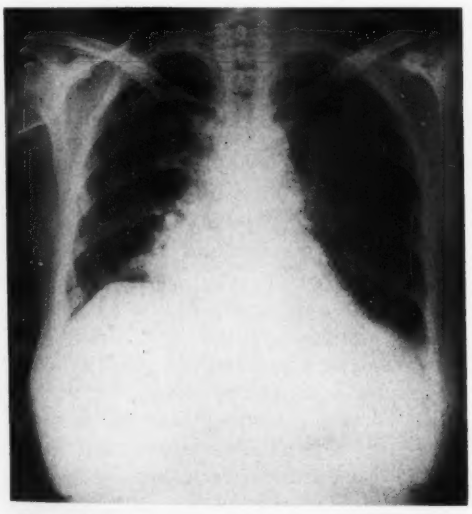
FIG. 5

(Case 3) This represents the second film of the chest. Pleural effusions were not suspected at this time. In retrospect, the cardiac enlargement with congestive changes and also the slight increase in width between the stomach bubble and the diaphragm leaf on the left would indicate that minimal fluid was probably present at this time.

definite collection of fluid in the left pleural cavity (Fig. 4).

This effusion was apparently on an inflammatory basis associated with the generalized process described. A definite etiology was not established but the clinical findings indicated that mesenteric adenitis with associated pleural effusion due to *Pasteurella pseudotuberculosis* was a likely possibility.[5]

FIG. 6



(Case 3) After an interval of 9 days, the diaphragm leaves appear to have shown a moderate elevation and the stomach bubble is seen to be quite low in relation to the left diaphragm leaf.

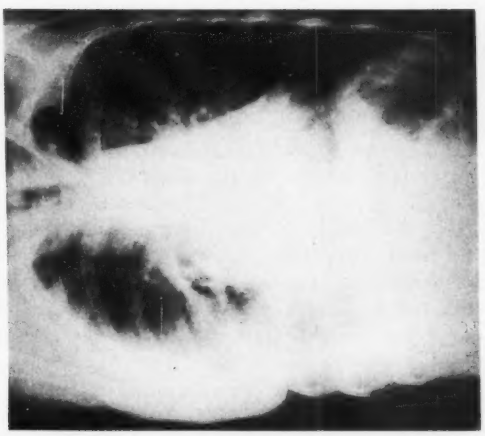
FIG. 7

(Case 3) A left lateral decubitus film shows a slight collection of fluid gravitating into the dependent left lateral portion of the pleural space.

Case 3. Mrs. M. L. B., age 58, was admitted to the Mississippi Baptist Hospital on Aug. 22, 1958, following outpatient treatments for congestive failure with dyspnea and chest pain intermittently for several months. It was known that she had an acute myocardial infarction in April, 1958, and that aortic stenosis was present.

Films of the chest were made on admission, Aug. 25, 1958, repeated 5 days later (Fig. 5), and again 9 days later (Fig. 6), showing some cardiac enlargement

FIG. 8



(Case 3) A right lateral decubitus film shows a moderate collection of fluid in this right pleural space with the diaphragm leaf being at a normal level.

with possibly minimal congestion. However, because the diaphragm bilaterally appeared to be somewhat high, a film was made in the left lateral decubitus, demonstrating fluid in the left chest (Fig. 7). When the decubitus film was made in the opposite position, an even larger amount of fluid was demonstrated in the right pleural cavity (Fig. 8).

Discussion

Most observers agree that the appearance of the usual pleural effusion, presenting with the lateral portion of its curve higher than the medial, is due to a combination of gravity, hydrostatic pressure, the retractile power of the lungs, and the capillarity of the pleura. Many authors have theorized as to the pathogenesis of infrapulmonary effusions, but there is no proof that any of the usual factors which cause the average pleural effusion to assume a typical configuration are appreciably altered in cases of this type. It has been stated that changes in the character of the pleura produced by inflammation or adhesions will affect the shape of the fluid somewhat. Pulmonary fibrosis, consolidation, or edema, by reducing the retractile power of the lung, allow gravity to exert its influence.

It has been postulated by Friedman[6] and Hessen that all pleural effusions probably begin as an infrapulmonary collection. Gravity tends to pull the fluid to the most dependent portion of the chest cavity, the posterior and lateral sulci. Capillary attraction can then conceivably draw the fluid between the lung and the diaphragm. As more fluid accumulates in this location, it eventually spills over to assume the typical configuration.[7]

When a collection of fluid occurs between the basal surface of the lung and the superior surface of the diaphragm, the roentgenographic appearance seen must be distinguished from subphrenic abscess, paralysis of the diaphragm, atelectasis, eventration of the diaphragm, hernia of the diaphragm, intrapleural or intrapulmonary neoplastic disease.[8] As stated by Rothstein and Landis,[9] the most important feature in diagnosis of infrapulmonary pleural effusion is a high index of suspicion. It is probably more difficult to detect this fluid pattern in the right chest cavity than in the left, since the density of the liver is the same as that of the fluid. On the left, contrast supplied by the gastric air bubble often facilitates an early suspicion of subpulmonary fluid, this appearing as a broadening of the density between lung above and stomach below.

If only one leaf of the diaphragm appears to be elevated, an infrapulmonary collection of fluid may more readily be suspected radiographically. If both sides are equally elevated, as in our Case 3, the possibility of bilateral subpulmonary collection is usually not considered, and an alert clinician may then be the first to suspect pleural effusion. When suspected, useful procedures in differential diagnosis include flouroscopy, films in the lateral decubitus, demonstration of the stomach bubble, pneumoperitoneum, pleural tap, with the use of films in the lateral decubitus being considered the simplest and most useful. Decubitus films and other positional films are extremely helpful in localizing the position of the diaphragm, in determining the amount of fluid present, and in giving a better view of the immediate supradiaphragmatic area of the lungs to rule out intrapulmonary pathology in this region.

Summary and Conclusions

1. In the last 100 cases of pleural effusion at the Mississippi Baptist Hospital, 16, or 16%, showed a predominantly subpulmonary distribution with a relatively clear costophrenic sinus. Eight of these cases, or 8%, were of the pure subpulmonary type with a sharp sinus, and fluid could only be suspected by means of decubitus films or other special diagnostic procedures.

2. As demonstrated in Cases 2 and 3, the diagnosis may not ordinarily be suspected on the plain upright film and, as with many other conditions, to suspect is to diagnose.

3. The smaller the effusion the more likely it will be of the subpulmonary type, but unexpectedly large collections are seen presenting in this manner.

4. Decubitus films are not only helpful in demonstrating subpulmonary collections, but aid further in localizing the position of the diaphragm, in estimating the amount of fluid present, and in obtaining a better view of the immediate supradiaphragmatic area of the lung to rule out intrapulmonary disease.

5. Subpulmonary collections of fluid appear to be more frequent in occurrence than the number of reports in the literature would

indicate. Since relatively few articles devoted to this subject have appeared in the general medical literature, we hope that this study will be of interest in pointing out the frequency, importance of recognition, and simplicity of demonstration of subpulmonary fluid collections.

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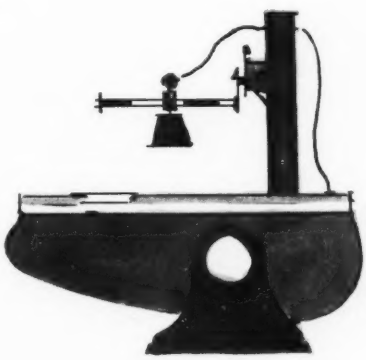

CASE REPORT

Extra-Adrenal Retroperitoneal "Nonfunctioning" Paraganglioma:

Report of a Case and Review of the Literature

JOHN E. SKANDALAKIS, M.D., ROSINA VINCENZI, M.D., EDGAR O'CONNOR RAND, M.D., and DAVID HENRY POER, M.D.,† *Atlanta, Ga.*

EXTRA-ADRENAL RETROPERITONEAL PARAGANGLIOMA is a rare tumor. Such a tumor may occur at any place along the sympathetic ganglionated chain. The most common location of the tumor is near the organs of Zuckerkandl, which are located at the origin of the inferior mesenteric artery on either side of the aorta. However, cases have been reported locating the tumor about and near the adrenals, kidneys, below the pancreas, around the abdominal aorta, etc. According to Pack and Tabah,[1] the incidence of these tumors, in comparison with the pheochromocytomas (similar tumors arising from the paraganglionic cells of the adrenal medulla), is about 1 in 12 cases. Cases of intrathoracic paragangliomas have been reported.[6]

The paraganglioma can be active or inactive. When active, according to Stout,[2] it should be called pheochromocytoma. We believe that the term "paraganglioma" should always apply to these extra-adrenal tumors, but a better term would be "extra-adrenal, retroperitoneal, functioning (or nonfunctioning), chromaffin (or non-chromaffin) paraganglioma." When functional, they act as a pure pheochromocytoma, presenting symptoms and signs of paroxysmal or sustained hypertension.

Case Report

A 63 year old white man, with a mass in the right upper quadrant of two years duration, was admitted to the Piedmont Hospital. The mass was asymptomatic until 3 weeks prior to admission, when the patient began to have a fullness in the epigastrium, associated with a dull ache. Ten days prior to admission, the mass had enlarged to the size of an orange.

Past History. Appendectomy was done in 1941 (ruptured appendix with peritonitis). Generally, the patient has enjoyed good health, denying any disease of the gastrointestinal tract, heart, or lungs.

Physical Examination. There was a large palpable mass located in the right upper quadrant having an approximate diameter of 5 cm. The mass had a hard consistency and was not lobulated. There was some tenderness on palpation, but no rebound tenderness or muscle spasm. Peristalsis was present. The remainder of the examination was within normal limits.

Clinical Course. The patient was admitted to the hospital on Oct. 1, 1956. On Oct. 2, 1956, x-ray studies of the chest showed emphysema. An intravenous pyelogram was reported as normal. Radiologically, it was felt that the mass most likely represented a cyst of the liver or a pseudocyst of the pancreas. It was felt that this did not represent either an aneurysm of the abdominal aorta or a renal neoplasm. CBC and urinalysis were within normal limits. On Oct. 4, 1956, (four days after admission) the patient underwent an exploratory laparotomy. A large mass was found located just under the gastrohepatic and hepaticoduodenal ligament. The common hepatic duct, portal vein, and hepatic artery were densely adherent to the anterior surface of the mass. The mass was found to be unresectable. A biopsy was taken during the operation and a frozen section was reported as "malignant." The patient expired 6 hours after the operation. At autopsy an extra-adrenal retroperitoneal paraganglioma was found,—the diagnosis made under the microscope.

Comment

The most significant thing about this case is that the diagnosis was not made prior to operation, in the operating room, or in the

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autopsy room. This patient never had hypertension with tachycardia, palpitation, headache, or numbness, in other words, he never presented the clinical picture of pheochromocytoma.

Operating Room Findings. (1) Topographic Anatomy. The tumor having a diameter of 10 cm., was located just beneath the hepaticoduodenal ligament. The common duct, portal vein, hepatic artery, first and second portion of the duodenum as well as head of the pancreas were heavily fixed to the tumor.

(2) Gross Pathology.
Appearance: vascular
Color: grayish-yellow
Consistency: hard
No local invasion or infiltration was noted.
Impression: retroperitoneal sarcoma

(3) Frozen Section: malignancy.

(4) Course. The course was stormy in the operating room. In three instances the B.P. rose to 200/120. The patient went into a shock-like condition several times, and 3 pints of blood were given during the procedure. He lost approximately 500 cc. of blood during the procedure, bleeding from the incision. He received 2 pints of blood.

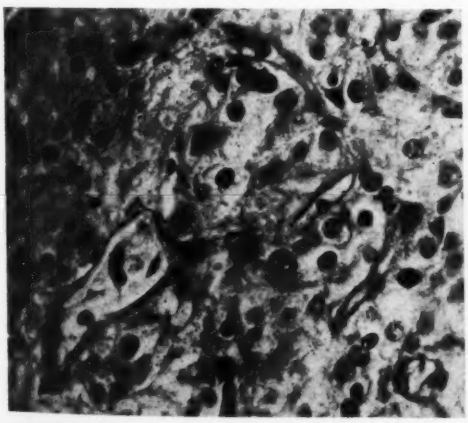
Cause of death 6 hours later: Postoperative irreversible shock.

At Autopsy. The mass was completely encapsulated. The location was as described above, it definitely originated from the retroperitoneal space, and the inferior vena cava was densely adherent to the posterior surface of the mass. The tumor had no relation to the right kidney or the right adrenal. It was found impossible to separate the inferior vena cava posteriorly, the duodenum, head of the pancreas, portal vein, common duct and hepatic artery anteriorly.

Impression. Retroperitoneal sarcoma.

Cause of Death. Shock? (1,000 cc. of blood in the abdominal cavity).

FIG. 1



Many medulla-like cells showing great variation in nuclear size and staining intensity; abundance of fine capillaries. (x 480)

FIG. 2

Growth of epithelial (medulla-like) cells with numerous capillaries, showing great variation in nuclear size and staining intensity (x 150). Negligible mitotic activity (confirmed by H. P. view).

Tumor. (Final microscopic diagnosis of the mass was reported as follows.) The tumor described in the retroperitoneal space shows considerable degeneration. Many areas are so acellular and necrotic that no living cells are present. In the better preserved areas the tumor assumes a pattern of small nests and groups of cells surrounded and separated from each other by a capillary stroma. The capillary stroma is unusually prominent. The cells have indistinct cytoplasm. The cytoplasm is pink and granular in appearance, and abundant. Their nuclei are generally hypochromatic and very slight in size. A few giant nuclei are seen. The nuclei are generally ovoid to circular in shape. Mitoses are rare. A few nerve cells are present near and within the capsule of this tumor. Other sections showed medulla-like cells (Figs. 1 and 2).

Diagnosis. Extra-adrenal retroperitoneal paraganglioma.

Discussion

In retrospect, several points must be emphasized:

(1) The lack of a diagnosis due to lack of symptoms.

(2) The lack of proper attention to the fluctuating blood pressure as well as the shock-like episodes during the operation.

(3) Excessive manipulation. Because of the unknown nature of the lesion, "the tumor was not handled with the gentle respect one would ordinarily give such a lesion," using the same words that Pack and Tabah[1] used in a similar case. Certainly, the patient's behavior during the operation was suggestive of a vasopressor substance being expressed from the tumor.

(4) Unusual location. It is known that the abdominal sympathetic ganglionated chain consists of ganglia lying in the retroperitoneal space anterior to the lumbar vertebrae and under the vena cava on the right side, and under the aorta on the left.

According to Kohn,[3,4] chromaffin cells (cells which show chromaffin granules when brought into contact with potassium bichromate), can be found along the entire length of the autonomic nervous system. Such cells can be found also in the ganglia of the same system. However, it is accepted today that small islands of chromaffin and nonchromaffin tissue (both histologically similar) may be found in the retroperitoneal space and other spaces or organs of the human body (carotid body, vagus and glossopharyngeal nerves, etc.).[5] There is confusion in the literature concerning these chromaffin and nonchromaffin tumors. The name "paraganglioma" is freely applied to both tumors and here is the misconception and the mistake.

Table 1 indicates the differences between these two types of tumors which are both termed paraganglioma.

TABLE 1

	Chromaffin		*Nonchromaffin*	
Chromaffin reaction	Positive		Negative	
Innervation	Efferent preganglionic sympathetic fibers (motor)		Sensory or afferent	
Secretion	Adrenalin Sympathin (?)		Acetylcholine (?)	
Origin	Related to certain tissues of the sympathetic nervous system		From parasympathetic neuroblasts (?)	
Clinical	*Active* Paroxysmal or sustained hypertension	*Inactive* Pressure signs only, if any	*Active* Questionable	*Inactive* Pressure signs only, if any

Summary

The nature of the rare retroperitoneal extra-adrenal paraganglioma has been discussed. This case report is presented to emphasize the care which one should take in handling a retroperitoneal tumor even though no clinical evidence of hormonal activity is present prior to operation. Although diagnostic evidence in the case presented is lacking to determine accurately the evidence of a functional tumor, the patient's course during the operation and afterwards suggests that the tumor was active.

Brief differentiation is also made between chromaffin and nonchromaffin "paragangliomas," and a plea is made to precede the word "paraganglioma" with the terms "Retroperitoneal Extra-adrenal, functioning (or nonfunctioning), chromaffin (or nonchromaffin)."

Acknowledgments

The authors wish to thank Dr. Geoffrey Bourne, Professor and Chairman of Anatomy at Emory University, for his interest and assistance in the laboratory studies of this tumor.

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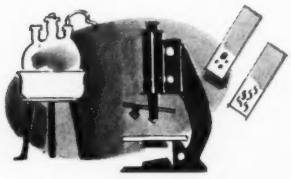

Buccal Incision for Chin Implants

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The author emphasized the advantages of using costal cartilage from a cadaver for this technic for reconstructive surgery of the receding chin.

ABSENCE OF THE NORMAL PROMINENCE OF THE CHIN is unconsciously associated with weak character and from the viewpoint of classical lines is unattractive. Receding chins are often accentuated by protruding upper teeth and a lax lower lip. The immediate effect of a chin implant is quite dramatic, particularly from profile and three-quarter views. The protrusion of the upper teeth is partially camouflaged and the implant beneath the chin skin takes up the slack of the lower lip. When a receding chin is riding under the shadow of a large nose there is a relative exaggeration of both features. The solution lies not in bolstering the chin until it juts equal to the prominent nose or in trimming the nose to insignificance to balance the diminutive chin. Rather it lies in a compromise,—to build up the chin to fit the rest of the face, then to reduce the nose to match the new chin (Fig. 1, A and B).

Choice of Implant

In severe malocclusion or marked microgenia, bilateral osteotomy may be the procedure of choice, but in lesser degrees of the deformity an implant is sufficient. A patient, unwilling to go through an extensive osteotomy, may be greatly benefitted by a mere chin implant. Therefore, it is essential to keep the procedure uncomplicated. Thus, the ideal autogenous implants of iliac bone or rib cartilage have not been used.

Homologous costal cartilage from a cadaver and preserved in 1:1000 aqueous Merthiolate provides, without additional surgical manipulation, unlimited material which is easily carved in one piece to the desired shape.[1] The ends of the cartilage are bevelled carefully so the implant will fit unnoticed as an onlay. Whereas smaller homologous cartilage grafts may be absorbed, a cartilage implant to the chin is large enough to be walled off by a fibrous capsule and maintained as a permanent contour.

In countries where rib from the human cadaver is made unavailable by law, heterologous cartilage, if sufficiently thick to supply a large enough implant in one piece, has served well.[2] Aufricht's[3,4] ingenious and economical use of diced autogenous nasal hump and septal cartilage is excellent, if the hump is large enough and the septum requires resection. In my limited experience it has been slightly more difficult to obtain an even, symmetrical prominence and avoid jutting spicules when the implant is composed of multiple unequal pieces of chopped bone and cartilage. Ivalon sponge is another possible material for chin implant, but the simplicity and success enjoyed with homologous cartilage has kept it as our first choice.

Surgical Considerations

Buccal Approach. Eight years ago I began using the incision in the buccal sulcus for chin implants as it seemed to avoid many of the minor objections encountered by the submandibular approach.[5] Primarily it produced no telltale scar. Technically it is easier. An incision under the chin should be made as small as possible to reduce the size of the visible scar. When the skin incision is small the pocket to receive the cartilage must be made larger than the length of the implant itself, otherwise insertion is impossible. With a pocket too large there is far more chance of the implant slipping off-center. The incision in the buccal sulcus, on the other hand, produces no visible scar and thus can be cut the exact length of the implant and the pocket. The cartilage then passes easily through the incision into the pocket fitting snugly without threat of migration.

Minimal Hazard of Infection. When the description of this technic was first published several experienced surgeons expressed the

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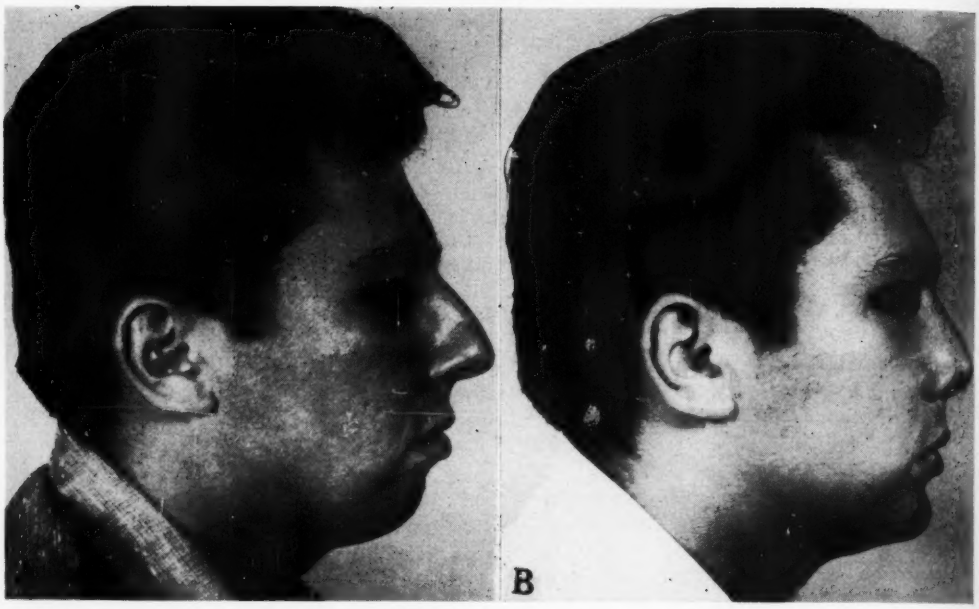
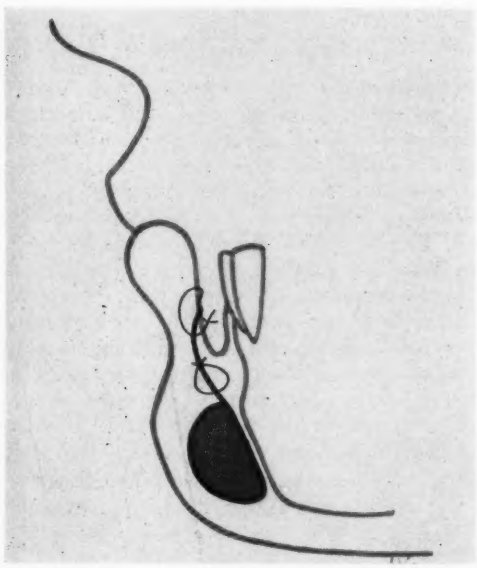
FIG. 1



(A) A prominent nose and a hanging lower lip exaggerate a receding chin. (B) After reduction of the nose and a chin implant, nose, lip and chin settle into a more satisfactory relationship.

FIG. 2



The incision is made on the lip side of the lower buccal sulcus leaving a mucosal flange and a soft tissue pad protecting the mandible. The cartilage implant is introduced into the tailored pocket in front of the mandibular periosteum and fixed in position with the first line of interrupted subcutaneous sutures. The second and final layer of the closure is a row of mattress sutures in the mucosa.

feeling that the chance of infection was too great. Probably because of this fear many are still hesitant to use the buccal approach. The purpose of this report is to encourage its use since the hazard of infection has been found of no significance. Out of 40 chin implants inserted through the buccal incision over an 8 year period none have been lost. Only one has been slightly troublesome and the difficulty in this instance is easily explained. In Korea, under unsatisfactory conditions, several implants were successfully inserted.[6] A bird-faced corporal had a nasal reduction and a chin implant. Two weeks later he received orders for transfer and, since his chin was too prominent, he requested reduction of the implant. It was explained that the excess was mainly postoperative swelling and would subside. The corporal's persistence, and the uncertainty of military conditions finally prompted me to remove the implant through the buccal incision, reduce and reimplant it only two and one-half weeks after its original insertion. A small abscess developed which was drained through a tiny submandibular stab. The infection cleared under antibiotic treatment and the cartilage

was retained. All other implants inserted through the buccal incision have been accepted and retained without incident.

Technic of Insertion. Certain logical precautions must be taken when a cartilage implant is inserted through a buccal incision.

(1) *Dental hygiene* is mandatory.

(2) *Mucosal flange* flap. Since the subcutaneous pocket is in continuity with the oral cavity the possibility of leakage of saliva must be avoided. Therefore, the buccal incision is not made in the depth of the sulcus where saliva can pool on the suture line, but rather up on the lip side so that a 1 cm. mucosal flange flap is developed.[5] The incision is made the same length as that of the cartilage and is extended downward, leaving a generous pad of subcutaneous tissue over the mandible until arriving at the predetermined position for the cartilage graft. The dissection then is carried to, but not beneath the mandibular periosteum and the pocket is tailored to the exact size of the implant (Fig. 2).

3. *A watertight closure.* Following insertion of the implant into the pocket, it is fixed in position by a two-layer closure with 5-0 chromic catgut. The first layer approximates the subcutaneous tissues; the second layer of mattress sutures in the buccal mucosa further seals off the closure (Fig. 2).

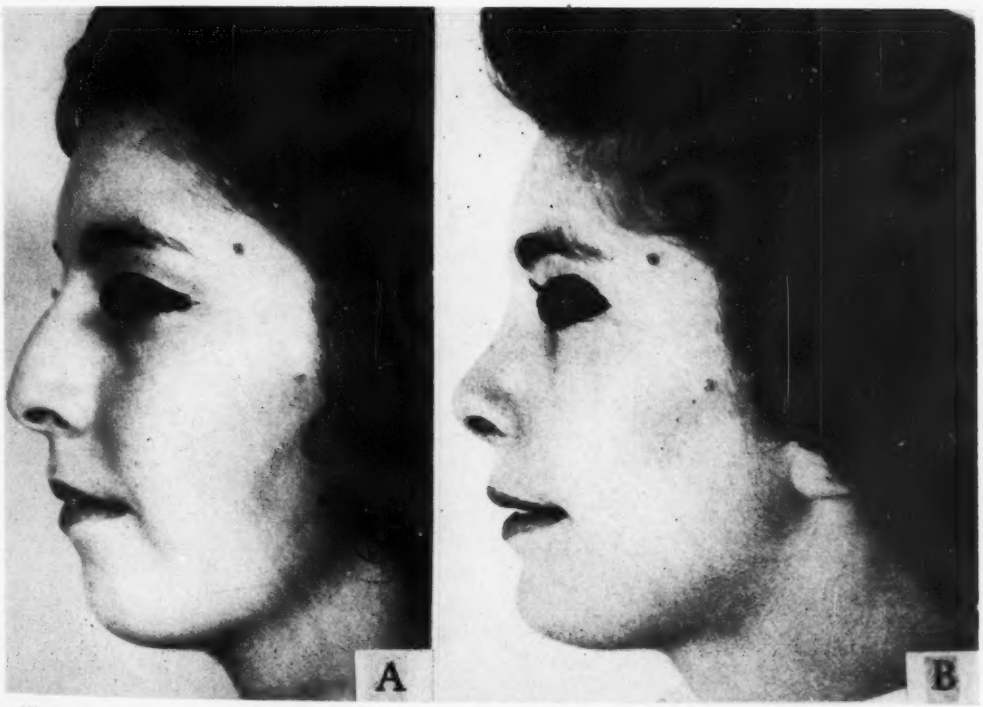
4. *Pressure dressing.* A small pad is strapped with pressure against the lower lip just superior to the implant. This pressure is maintained for 5 days to give the wound a chance to seal and heal.

5. *Antibiotics* are used prophylactically during the first 5 postoperative days.

Summary

The purpose of this report is to encourage a simple approach to the correction of receding chins. Homologous rib cartilage, easily kept in a bank and carved to shape, avoids a second operation on the patient. Insertion through a buccal incision produces no visible scar. Infection has been prevented by a mucosal flange flap, closure in two layers, post-

FIG. 3



(A) Nose overpowers chin. (B) With a little take and a little give they lined up more happily as a team.

operative pressure and antibiotics. A cartilage implant for a weak chin does more than increase chin prominence. It camouflages protruding teeth and takes up the slack of a hanging lower lip, both unattractive characteristics often associated with a receding chin. When the diminutive chin is overshadowed by a large nose the deformity is doubly exaggerated and in fact calls for a double plastic attack—a nasal reduction and a chin implant (Fig. 3, A and B). One need not be an "Andy Gump" to merit a chin implant any more than reduction rhinoplasties are limited to Cyrano de Bergeracs.

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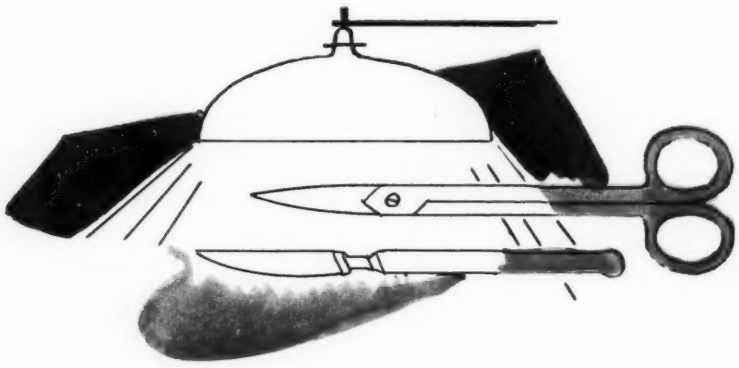

Nitrogen Mustard and Adrenocorticotropic Hormone in the Management of Patients with Incurable Carcinoma

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Nitrogen mustard seems to have a palliative effect in certain instances of advanced malignancy, either primary or metastatic.

THE PURPOSE OF THIS PAPER is to present our experience with the use of nitrogen mustard and ACTH in a series of 80 patients with far advanced malignancy. Published articles on this subject have been conflicting.[1-3] McCarthy[1] reported benefit, while Rollins[2] and Jones[3] were considerably less impressed. It is believed that a series such as ours, which was begun in 1955 and which has had 100% follow-up of patients, may be of some value. Furthermore, with the rapidly expanding interest in many chemotherapeutic and combined chemotherapeutic and surgical efforts now under way, this series can serve as a base line for subsequent evaluation of these other modalities.

Method

Patients were unselected. All had a histologic diagnosis of malignancy prior to treatment. All had evidence of far advanced disease, either with local or distant metastases. Nitrogen mustard in doses of 0.1 mg. per kilogram of body weight was given daily for 5 days. The drug was given into the tubing of a running intravenous infusion of 5% glucose in water. ACTH, 60 mg., was given intramuscularly every 6 hours beginning 18 hours prior to the first dose of nitrogen mustard and continued for 5 days, and then in decreasing doses over the next 2 days. Supportive treatment of antibiotics, blood and intravenous fluids was given as indicated. Complete blood counts were obtained before therapy, the third day of therapy, and at one week and two weeks after completion of the course of treatment. Determination of sodium, potassium, chloride, total protein and A-G ratio were done at the same time as the blood counts. Platelet counts were done before and at the completion of each course of therapy in a number of patients. Four to six weeks was the usual time interval between courses of nitrogen mustard and ACTH. In some patients this was increased to 2, 3 or 4 months. These patients were those showing a good or excellent response.

Results

For the purpose of evaluating palliation, we have used the same arbitrary criteria as McCarthy[1] (Table 1). *Excellent response* means subjective or objective remission for 6 months or longer. *Good response* means improvement in symptoms for 2 months or longer. *Fair response* means moderate relief for a few weeks. *Poor response* means patients who died within a month of therapy, or those surviving longer but with no relief of symptoms. In this series of 80 cases, other modalities of treatment were used. Palliative surgical treatment, when at all feasible, was used in 31 cases. X-ray therapy was used in

TABLE 1

CRITERIA OF EVALUATION OF PALLIATION

Excellent	=	Subjective or objective remission for 6 months or longer
Good	=	Improvement in symptoms for 2 months or longer
Fair	=	Moderate relief of symptoms for a few weeks
Poor	=	Death within one month of therapy or longer Survived with no relief

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50 cases. The x-ray treatment was given before nitrogen mustard and ACTH in 40 cases, and afterward in 10 cases.

Results are shown in table 2. In 10% of the cases the results were excellent. One patient having carcinomatosis of the peritoneal cavity is living and well after 3 years. In one case of lymphosarcoma the patient is living and well after 3 years. Three patients with carcinoma of the lung are living, two at a year and a half, and one at six months, and without evidence of recurrence to date. Fifteen patients (18.7%) had good palliation; all are dead. Nineteen patients (23.8%) had fair palliation; all are dead. Thirty-eight patients (47.5%) had poor palliation; all are dead.

Carcinoma of the Pharynx and Epiglottis. Five patients with carcinoma of the pharynx were treated. All had x-ray therapy before nitrogen mustard. There were 3 fair results and 2 poor results. All fair results were of short duration, and subsequent courses of mustard were of no benefit. One case had radical surgery followed by x-ray therapy and then nitrogen mustard at relapse. He received no benefit from this. We believe that nitrogen mustard has little to offer in this disease. Two patients with carcinoma of the epiglottis were treated, with one fair and one poor result. Both had had surgical and x-ray treatment. The results were not good.

Lymphoepithelioma. Three patients were treated. All had been treated with x-ray prior to treatment with nitrogen mustard and ACTH. There was one good, one fair and one poor result. In the patient having a good result, palliation was obtained after each of 3 courses. We believe that nitrogen mustard may occasionally be of benefit in this type of tumor.

Gastrointestinal Carcinoma. Carcinoma of the stomach,—two patients were treated. Both had had surgical treatment and were treated at the time of recurrence. One fair and one poor result were obtained. *Carcinoma of the tongue,*—two patients were treated, one with fair and one with poor palliation. *Carcinoma of the esophagus,*—six patients were treated. Three had surgical treatment and five had roentgenotherapy. There was one excellent, one fair and four poor results. The excellent result was in a patient treated with nitrogen mustard and ACTH prior to x-ray therapy. He responded well and lived 11 months, dying of cardiac failure. This result is certainly not necessarily attributable to nitrogen mustard, but his good response prior to x-ray therapy suggests some benefit.

Two patients with *carcinoma of the colon* were treated, one with good palliation, one with poor. The patient who had good relief consistently received 2 to 3 weeks relief of pain with each of 3 courses. His pain was from a perineal recurrence.

Carcinoma of the Bladder. Two patients were treated; one had had an operation, the

TABLE 2

PALLIATIVE RESULTS IN 80 PATIENTS WITH ADVANCED CANCER

	Results			
Lesion	*Excellent*	*Good*	*Fair*	*Poor*
Carcinoma of Stomach			1	1
Carcinoma of Colon	1			1
Carcinomatosis of Peritoneum	1			1
Osteogenic Sarcoma				1
Melano Carcinoma				2
Mesothelioma of Pleura		1		1
Lymphosarcoma	1			
Carcinoma of Esophagus	1		2	3
Carcinoma of Pharynx			3	2
Carcinoma of Tongue			1	1
Carcinoma of Neck				1
Carcinoma of Testicle				1
Carcinoma of Larynx			1	1
Carcinoma of Epiglottis			1	1
Lymphoepithelioma		1	1	1
Carcinoma of Bladder		1		1
Carcinoma of Lung	4	12	9	19
	8 (10%)	15 (18.7%)	19 (23.8%)	38 (47.5%)

other did not. There was one good and one poor result. The patient with the good palliation received benefits from two of three courses.

Melanocarcinoma. Two patients were treated with poor results in both. Both had their primary lesions removed surgically and were treated at the time of occurrence of far-advanced metastatic disease.

Diffuse Mesothelioma of the Pleura. Two patients were treated, one with good results, one with poor. The patient who had good results died six months later of coronary artery disease, after four courses of nitrogen mustard, still with his disease but asymptomatic.

Others. One patient with carcinomatosis of the peritoneal cavity due to adenocarcinoma, primary site undetermined, is alive 3 years following a short circuiting operation and three courses of nitrogen mustard and ACTH. His abdominal masses have disappeared and he is quite well. It is known that of all the types of carcinoma reported to undergo spontaneous remission, adenocarcinomatosis of the peritoneal cavity is the most frequent type. However, the response after nitrogen mustard and ACTH was very dramatic.

One patient with osteogenic sarcoma of the ilium received no relief. One patient having lymphosarcoma is alive and fairly well with his disease 3 years after his first treatment. One patient with carcinoma of the testicle received no relief. Two patients having carcinoma of the larynx were treated: one with a poor, one with a fair response. Both had surgical and x-ray therapy prior to other treatment.

Bronchogenic Carcinoma. Forty-four cases of bronchogenic carcinoma are included in this series. In four the patient received excellent palliation; two of these were treated immediately following palliative surgical resection. One is alive 20 months without evidence of recurrence. One is alive 8 months with evidence of recurrence. Twelve patients had good palliation, 9 had fair palliation and 19 had poor results.

A series of patients with bronchogenic carcinoma treated by us prior to, or concomitant with the cases treated with nitrogen mustard and ACTH and, in general, a comparable group, were studied to determine palliation and survival time. Table 3 is a breakdown of the palliation in these two series of cases. In comparison with the nonsurgical group, it is apparent that nitrogen mustard alone is of no value. X-ray treatment gives some palliation. It would appear from our figures, and this was our clinical impression, that nitrogen mustard prior to x-ray therapy gave some added palliation, whereas nitrogen mustard after x-ray treatment added very little.

If one compares the figures in our surgical group (Table 3), it is apparent that resection when at all feasible gives better palliation than any other modality. X-ray treatment plus nitrogen mustard at time of recurrence is of small but definite value. The most impressive group is that receiving nitrogen mustard immediately after operation. This group is small. Cole and associates[4] first suggested immediate treatment based on their experimental work. Three patients with the superior vena caval syndrome had excellent and rapid (1 to 4 days) relief of venous obstruction, and this persisted regardless of the subsequent outcome of the case.

Table 4 is a comparison of median survival time in these same two groups of bronchogenic carcinomas from treatment to death and from onset to death. In the nonsurgical group, nitrogen mustard alone adds nothing as compared with no treatment. X-ray therapy alone adds a few months, but nitrogen mustard plus x-ray treatment adds nothing to survival, either when given before or after x-ray therapy. In the surgical group, survival time with operation plus x-ray therapy or operation alone, or operation plus x-ray therapy plus nitrogen mustard, shows no interpretable dif-

TABLE 3

DEGREE OF PALLIATION IN BRONCHOGENIC CARCINOMA

Type Therapy		*Results*			
Nonsurgical	*No.*	*Excellent*	*Good*	*Fair*	*Poor*
No Therapy	14	0	0	0	14
HN_2 only	7	0	0	2	5
X-ray only	16	1	5	1	9
HN_2 then X-ray	8	1	4	1	2
X-ray then HN_2	17	0	4	6	7
Surgical					
Surgery only	7	4	1	1	1
Surgery then	8	6			2
X-ray & HN_2		(1)	(2)		(5)
Surgery + HN_2 (Intensive)	4	2	2		

TABLE 4

LIVING AND DEAD AND MEDIAN SURVIVAL TIME IN BRONCHOGENIC CARCINOMA

Type Therapy	*No. Case*	*No. Living*	*Median Survival Time R to Death*	*Median Survival Time Onset to Death*
Non Surgical				
No Therapy	14	0	2.0 mos.	6.5 mos.
HN_2 only	7	0	2.0 mos.	7.0 mos.
X-ray only	16	0	5.5 mos.	9.0 mos.
HN_2 then X-ray	8	1a	6.0 mos.	9.0 mos.
X-ray then HN_2	17	0	4.5 mos.	9.0 mos.
Surgical				
Surgery only	7	3b	16.0 mos.	17.0 mos.
Surgery then X-ray	8	0	18.0 mos.	21.0 mos.
Surgery then X-ray then HN_2	8	2	7.5 mos.	15.5 mos.
Surgery + HN_2 (intense)	4	2d	7.5 mos.	15.5 mos.
a	b		c	d
13 mos.	64 mos.		36 mos.	18 mos.
	18 mos.		50 mos.	6 mos.
	8 mos.		61 mos.	

ference. There are still 8 survivors in this group of 25 cases, 4 of whom have not been followed over 18 months.

These 80 patients have received a total of 167 courses of nitrogen mustard and ACTH. Fourteen of 44 patients receiving palliation with their first course, received further palliation with their second course. Seven of 21 patients who received palliation from the second course received further palliation from the third course. Those patients who did not benefit from the first course never received any palliation with subsequent courses.

Toxicity. Toxicity (Table 5) with nitrogen mustard alone, especially nausea and vomiting and leukopenia, has been an annoying side effect of this therapy in the past. Only 9 patients had nausea and vomiting, in 2 it was severe. A breakdown of our cases reveals that one patient had a white bloodcell count below 2,000 cells per cu. mm., 6 had below 3,000 cells per cu. mm. and 5 had below 4,000 cells per cu. mm. There were no significant drops in hemoglobin. Oral moniliasis occurred in 9 cases. All cleared rapidly without any treatment within a period of 2 to 3 days. One patient developed tuberculosis. Presumably this was a breakdown of a "healed primary complex." He had no evidence of active disease prior to therapy, and it did not become evident until approximately one year after starting treatment, and after four courses of nitrogen mustard and ACTH. There were no cases of gastrointestinal bleeding. No effects were observed on sodium, potassium, chloride, or serum protein levels. Nor were there any instances of psychosis attributable to the drugs. There were two cases of purpura without depression of platelets and without any bleeding tendency; both recovered promptly. One patient with pruritis recovered promptly.

Discussion

From our experience with this series of patients, we believe that nitrogen mustard and ACTH have a small but definite place to play in palliation of advanced cancer. We were not as impressed as was McCarthy.[1] The series reported by Rollins[2] and Jones[3] was small, and their criteria for evaluating results differed from McCarthy's, hence accurate comparison is impossible.

We have noted that if no relief is obtained with the first course of treatment, subsequent courses never give relief. On the other hand, if any palliation is attained, subsequent courses at appropriate intervals gave further palliation in at least 25% of the cases.

The combination of ACTH with nitrogen mustard did prevent nausea and vomiting. The apparent protection of the bone marrow by ACTH remains unexplained. McCarthy[1] noted this phenomenon also. It may be that ACTH, by its lympholytic effect, suppressed the marrow so that on the subsequent administration of nitrogen mustard the marrow cells were rendered less vulnerable to this radiomimetic drug.

It has appeared from our experience in bronchogenic carcinoma that nitrogen mustard prior to subsequent irradiation gives slightly better results. Karnofsky[5] noted this also. The most obvious observation is that if

TABLE 5

TOXICITY HN_2 + ACTH

In 105 cases of malignancy treated with 290 courses of HN_2 + ACTH the following untoward reactions were observed:

1. Leukopenia
   (a) 2 courses, WBC less than 2,000 per cu. mm.
   (b) 7 courses, WBC less than 3,000 per cu. mm.
2. One case activated his tuberculosis
3. Eleven cases had nausea and vomiting, two severe, none necessitated discontinuing therapy
4. No significant fall in hemoglobin
5. No cases of gastrointestinal bleeding
6. No effect on serum proteins, sodium, potassium or chlorides
7. No cases of psychosis
8. Two cases purpura without platelet depression
9. One case pruritis

surgical excision can be done, palliation and survival are both increased. Shapiro[6] has done some experimental work which suggests unequivocally in the mouse that resection of gross tumor followed by a chemotherapeutic agent gives a better cure than when no surgical treatment is used or when the chemotherapy is used alone.

Cole and associates[4] have done clinical and experimental work using nitrogen mustard at time of operation and in the immediate postoperative period, their thesis being that circulating tumor cells are more vulnerable than a few days later once they have settled out and begun to grow. We have treated 4 patients in this manner and have 2 surviving 6 months and 18 months without evidence of recurrence.

Summary

1. Nitrogen mustard and ACTH give occasional good palliation in advanced malignancy. It would appear to have more frequent value in bronchogenic carcinoma.

2. Toxicity of nitrogen mustard is reduced by the concomitant use of ACTH.

3. Failure to obtain some relief with one course of nitrogen mustard contraindicates further use.

4. Treatment with nitrogen mustard in the immediate postoperative period may be of value.

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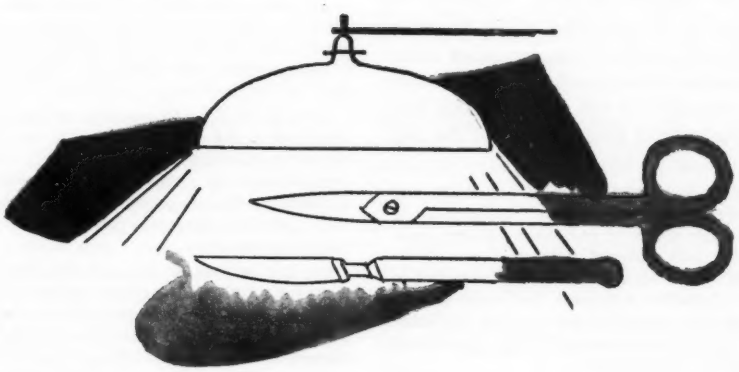

The Use of Adrenal Steroids in the Treatment of Sudden Collapse Associated with Surgery: A Review of Five Cases

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Clinical material, such as described here, is accumulating to point to the use of steroids under certain circumstances of collapse. More study and experience will be needed to outline the clear-cut indications. Careful observations are needed in all cases in which such therapy is used.

THE WIDESPREAD USE OF CORTISONE and its various derivatives has taught us that patients on steroid medication and requiring surgical intervention need increased amounts to prevent a crisis during or after an operation.[1-5] These observations subsequently included a group of patients who had had cortisone or cortisone-like compounds within a 6 months period antedating operation. Under those circumstances the resuscitative effects of the steroids were often dramatic with rapid restoration of the blood pressure and pulse.

The following cases reveal the need of corticosteroids in surgical patients subjected to unusual stress. It is believed these patients were in marginal adrenal compensation from chronic depletion, infection, and multiple operations. Knowledge of the past clinical history, no doubt, would have predicted the use of steroids in these patients.

Case 1. M. B., a 44 year old married housewife, was admitted to the Middlesex County Sanitorium in Sept., 1956, with far advanced pulmonary tuberculosis. For 10 years she had suffered from rheumatoid arthritis. She had taken Metacorten 5 mg. daily for a 5 month period prior to admission but none during the 4 months before operation. Her stay in the sanitorium was marked by stabilization of the tuberculosis and general physical improvement.

Four months after her admission she had a right upper lobectomy for advanced cavitary disease. She had had a normal ACTH test preoperatively. During the first portion of the operation she received 100 mg. of hydrocortisone intravenously. However, during the last hour of a tedious 4 hour dissection, she received no cortisone; 2,500 cc. of whole blood were given during the procedure and this was considered to be adequate replacement. As the skin sutures were being placed the anesthetist reported no blood pressure and a barely palpable pulse. Another 100 mg. of hydrocortisone in 500 cc. of dextrose-water was started intravenously. After 10 to 15 cc. of the solution had run in, there was an immediate return of blood pressure to 100/50. It was 120/70 twelve hours postoperatively. Following the operation, she was begun on intramuscular cortisone 50 mg. every 4 hours.

Eighteen hours postoperatively she had another drop in blood pressure to 80/40. However, with administration of an additional 100 mg. of hydrocortisone intravenously, the blood pressure rose to 110/50. The intramuscular cortisone was then increased to 400 mg. a day with excellent maintenance of vital signs. Over a 4 week period the dosage was gradually reduced and finally omitted without ill effects. She received isoniacid, penicillin, and streptomycin in addition to the steroids.

Case 2. E. P., a 62 year old unmarried woman, was admitted to the hospital with a 2 year history of progressively disabling ulcerative colitis. Her course was complicated by marked weight loss, intractable diarrhea, perianal infection, arthritis and conjunctivitis. Medical measures, including steroids, failed to induce a remission.

On Oct. 8, 1956, a subtotal colectomy and ileostomy were done. Thirty-six hours following the operation, at 7:15 a.m., the blood pressure was unobtainable but a barely perceptible apical pulse could be heard. Undiluted hydrocortisone, 50 mg., was injected into the femoral vein with return of the blood pressure to 100/40 in about 30 seconds. An additional 50 mg. of hydrocortisone were given intravenously in 500 cc. of 5% dextrose-water solution with restoration of the pressure to 130/80.

The following studies and results were obtained at this juncture: hematocrit 49%, Hgb. 14.2 Gm., sodium, 132, potassium, 3.3, and chloride, 100 mEq./L. She received 300 mg. of cortisone intramuscularly for 4 days

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and then oral dosages were begun. The cortisone was gradually tapered off, and at the end of 3 weeks it was omitted without untoward results. During a part of her postoperative course, she received chloromycetin and erythromycin.

Case 3. F. P., a 27 year old married housewife, was admitted to the hospital with a 3 month history of debilitating ulcerative colitis complicated by a rectovaginal fistula.

While in the hospital, she developed signs and symptoms of peritonitis making operation mandatory. A subtotal colectomy and ileostomy were performed rapidly. The colon had perforated in many places. Her immediate postoperative course was attended by an episode of shock which responded to blood and plasma. After a stormy convalescence, she was discharged to her home.

Following abdominoperineal resection 6 months later, she developed multiple abdominal fistulas. Subsequently an exploratory laparotomy was done to resect the fistulas. Eighteen hours after the operation, at 8:00 a.m., she became cyanotic, with no demonstrable blood pressure and a rapid, thready pulse. Fifty milligrams of undiluted hydrocortisone was given via the left femoral vein followed by a rise in blood pressure to 110/70.

The following studies and results were obtained at that time: Hgb. 12.6 Gm., sodium, 126, potassium, 4.2, and chloride, 85 mEq./L.

She was maintained on 300 mg. of cortisone daily for 4 days and then this was slowly decreased over a 3 week period and stopped. Large doses of chloromycetin and erythromycin were given during the postoperative period.

Case 4. A. H., a 48 year old male alcoholic, was admitted to the Middlesex County Sanitorium in May, 1956, with bilateral far advanced pulmonary tuberculosis.

His course was complicated by a bronchopleural fistula and empyema on the right side. A right pleuropneumonectomy was carried out on Dec. 6, 1956. By Jan. 14, 1957, he had developed an empyema necessitans which required rib resection and drainage.

On Feb. 12, 1957, a limited thoracoplasty was done resecting the ribs 2 to 9. Two hours following the operation the blood pressure was 52/0. Additional blood and plasma were given without a return of vital signs to satisfactory levels. Hydrocortisone, 100 mg. intravenously, in 500 cc. of 5% dextrose-water solution was begun, but only a slow rise in the pressure to 90/40 was obtained. Another 100 mg. hydrocortisone was administered with an increase in blood pressure to 100/50. He was placed on a dosage of 400 mg. of cortisone intramuscularly per day. Forty-eight hours postoperative, at 8:15 a.m., he went into pulmonary edema but this responded well to therapy. However, 51 hours after operation he became cyanotic with a blood pressure of 40/0. A very rapid pulse was felt only in the groin. There was considerable respiratory difficulty from tenacious secretions which could not be aspirated. A tracheostomy was done with improvement in the respiratory difficulty, but no improvement in the vital signs was observed. Hydrocortisone, 200 mg., was given in 500 cc. of 5% dextrose-water solution, and over a period of 5 to 10 minutes the blood pressure reached 90/40. A total of 500 mg. of cortisone was given during that 24 hour period.

His vital signs have been stable since then, permitting gradual reduction in the steroid dosage. Chloromycetin, streptomycin, and INH were employed as antibiotics in the postoperative period.

Case 5. M. G., a 49 year old unmarried woman, was readmitted to the Middlesex County Sanitorium in Feb., 1957, with far advanced bilateral pulmonary tuberculosis. She had received pneumothorax therapy 20 years previously, but refills were abandoned because of a right-sided pleural effusion which never completely disappeared. This was positive for acid-fast organisms.

In Oct., 1956, she developed an empyema necessitans requiring readmission to the sanitorium. The patient was chronically ill and weighed only 80 pounds. There was a draining sinus of the chest wall. Bronchoscopy revealed complete stenosis of the right main stem bronchus and x-ray studies confirmed destruction of the entire right lung. The Thorn test gave no evidence of Addison's disease. The eosinophils dropped from 225 to 100 in 4 hours after 25 mg. of ACTH intramuscularly. The blood pressure was 120/90, pulse 92, and respiration 24. The serum electrolytes were sodium, 129, chloride, 108, and potassium, 4.1 mEq./L.

In April, 1957, a right pleuropneumonectomy was done. Forty-five minutes after the operation had begun, the blood pressure was unobtainable and the pulse could not be felt. Feeble pulsations of the heart could be seen through the pericardium. Hydrocortisone, 100 mg., in 500 cc. of 5% dextrose-water was commenced with a rise in blood pressure to 70/50 in 3 or 4 minutes. The pulse was slow and forceful. However, at the close of a 3½ hour operation, her blood pressure was again 80/50. She was unable to breathe alone and had to be assisted during the early postoperative period. Two thousand cubic centimeters of blood were used during the procedure and this was interpreted as satisfactory replacement. She received a total of 400 mg. of steroids in divided doses for 4 days; this dose was gradually reduced over a 4 week period. The vital signs have subsequently been well maintained. Chloromycetin, erythromycin, INH, and streptomycin were selected as appropriate antibiotics by sensitivity tests.

Discussion

These cases illustrate the value of the steroids in supporting severely ill patients. In all 5 cases there was an underlying chronic depleting disease with long-standing infection. There was no clinical evidence of Addison's disease in any of the patients. In only 2 cases, in which cortisone had been used before operation, was there knowledge of possible adrenal cortical suppression. Yet each patient exhibited a unique type of collapse which responded to the intravenous use of corticosteroids. It seems from reviewing these cases for the future application of therapy to similar cases

that the need for the steroids could be predicted in almost every instance from the clinical history.

The patients in dire need of steroid support following a surgical procedure usually present a picture of sudden vascular collapse. Attempts in resuscitating the patient with blood or plasma is without avail. Yet with intravenous corticosteroids, an impressive correction in vital signs is obtained.

Obviously, the most desirable method of counteracting hemorrhagic shock is ligation of the offending vessel and adequate blood transfusion. In cases of shock occurring during or after an operation without excessive blood loss and with a history of previous cortisone therapy or chronic disease, intravenous steroids are employed immediately. If a satisfactory response in vital signs is observed from hydrocortisone intravenously, the patient is given 300 to 500 mg. of cortisone a day. Hydrocortisone is given intravenously in 100 to 200 mg. doses, and the remainder of the 300 to 500 mg. of cortisone is administered intramuscularly. The 300 to 500 mg. daily doses are usually required for from 3 to 4 days. Subsequently, the oral preparations of cortisone are gradually tapered off over a 3 to 4 week period. The patients are usually kept on 12.5 mg. of cortisone orally daily for one week and before the drug is omitted altogether. This small dosage of cortisone orally permits the adrenal cortex to assume some role in the production of steroids. Corticotropin may be used to stimulate the adrenal gland if steroids have been used over prolonged periods. Vasopressor agents were not employed in these cases.

Kass and Findland[6] have made it clear that cortisone is supportive rather than curative. In the cases in which infection played such a primary role, the proper antibiotics were imperative.

It would seem that there is more to this type of collapse than adrenal exhaustion alone. The fact that such high doses of cortisone are required to restore vital signs tends to point toward additional factors. Kirsner and associates,[7] mentioned in their papers, dealing with the treatment of ulcerative colitis, that anti-substances or antihormones in the blood might inactivate cortisone except in load doses. Those comments seem especially pertinent.

It is not intended to portray hydrocortisone in the management of surgical shock as a panacea. Haste exercised in its use is ill advised, but it should not be withheld if the clinical history of the patient should indicate its use. The appropriate antibiotic should always accompany cortisone in cases in which infection is playing any role in the production of sudden collapse.

Summary and Conclusions

1. Case histories have been presented of surgical patients with chronic depleting disease and underlying infection who develop sudden collapse not attributable to blood or fluid loss. All of these patients responded to intravenous steroids.

2. Initially, dosages of hydrocortisone ranging from 100 to 200 mg. in 500 cc. of 5% dextrose and water are required. The daily dosage following sudden collapse is usually 300 to 500 mg. of cortisone intramuscularly for 3 to 4 days. Cortisone orally is used as soon as it is feasible.

3. The dosage of cortisone is gradually reduced and then omitted after a 3 to 4 week period. Corticotropin may be used to wean the patient from the steroids.

4. The shock which responds to cortisone tends to occur during operation or within the first 48 hours following the operation.

5. The theory of inactivation of cortisone by an antisubstance or antihormone is mentioned.

6. Large doses of appropriate antibiotics should be given in cases with any element of underlying infection.

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Carcinoma of the Breast: A Small Private Series*

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The outlook in carcinoma of the breast has changed little over the years. Advances have been made, however, in a better determination of the degree of surgery indicated by biopsy study of draining lymph nodes.

THE TREATMENT OF CARCINOMA OF THE BREAST has undergone little change since Halsted[1] and Meyer[2] described radical mastectomy 70 years ago. While these two went about their respective procedures differently, the end result was essentially the same, and all of us doing radical mastectomy today follow one of the two methods. During the past 20 years the results of surgical treatment have shown little improvement. What improvement we have seen can be attributed to advanced knowledge in anesthesia and physiology, education of the public and medical profession as to the importance of removing all breast nodules, and more careful selection of patients with carcinoma of the breast for radical mastectomy. It is in this last area that we may improve our results by eliminating those cases that have already advanced beyond the limits of radical mastectomy.

All primary cases of carcinoma of the breast seen at the St. Vincent's Hospital during the years 1940 to 1950 by one of us (F.C.W.) were reviewed. During this period 46 women were seen. Forty-three were candidates for radical mastectomy and 3 had a simple mastectomy.

Axillary nodes were free of metastases in 26 (59%) and were found to be involved by tumor in 16 (41%). The surgical specimen of one patient, who was lost to follow-up, failed to reach the pathologist.

Twenty-three of the 26 who had no involvement of the axillary nodes were available for follow-up (Table 1), and 17 (76%) are living free of disease. Four died of carcinoma and 2 of intercurrent disease. Three who died of carcinoma had lesions measuring 4 to 5 cm. in diameter. One had a small lesion which was known to have been present for at least one year.

TABLE 1

RESULTS IN CASES WITH NEGATIVE AXILLARY NODES

	No.	%
Living and well	17	16
Died—breast carcinoma	4	18
Died—intercurrent disease	2	8

Of the 16 patients with involvement of the axillary nodes only 13 were available for follow-up (Table 2). Six died of carcinoma of the breast, 2 of proven rectal carcinoma, and 2 of cardiovascular disease. Only 3 (23%) are living free of disease.

There were 2 patients who had bilateral breast carcinoma. One died shortly after the second operation of carcinomatosis. Another, who had radical mastectomies in 1945 and 1950, had a panhysterectomy in 1947 for carcinoma of the ovary. She died in 1954 of cardiovascular disease, clinically free of carcinoma. There were 2 patients who developed carcinoma of the colon, and one carcinoma of the endometrium; the latter is living and well today. Almost 10% of these patients subsequently developed malignancies of other organs. This re-emphasizes the fact that multiple malignancies occur frequently and we should keep this in mind when doing follow-up examinations.

TABLE 2

RESULTS IN CASES WITH POSITIVE AXILLARY NODES

	No.	%
Living and well	3	23
Died—breast carcinoma	6	46
Died—other malignancy	2	15
Died—intercurrent disease	2	15

*Read before the Section on Surgery, Southern Medical Association, Fifty-Second Annual Meeting, New Orleans, La., November 3-6, 1958.

Of particular interest is a 43 year old woman first seen 9 years ago with a 1 cm. sized nodule in the outer quadrant of the right breast which had been present for 2 years. This proved to be a scirrhous carcinoma with no involvement of the axillary nodes. This woman was myxedematous from chronic thyroiditis. That her fortunate result was in any way due to hypothyroidism makes interesting speculation.

Another patient, age 47, was seen because of bloody discharge from the right breast of several months duration. The area causing the discharge could not be localized and a simple mastectomy was done. The pathologist found, in addition to several intraductal papillomas, a small 4 to 5 mm. area of scirrhous carcinoma. When radical mastectomy was done several days later one axillary node was found to contain tumor. After 8 years this woman is living free of disease.

This series is too small to have statistical significance. Nevertheless, the survival figures fairly well approximate those of larger reports. We expected to find a somewhat better cure rate because the patients were seen earlier in the disease. This was not the case. Fifty per cent of those without metastasis to the axillary node had known a mass was present for 5 months or longer. Only 40% of those with metastasis to the axillary nodes had their disease discovered 5 months before operation. Another unexpected finding was that the 4 cases designated as having lesions of the inner quadrant are living and free of disease.

Findings such as these emphasize again that an individual's chances of cure depend solely upon the biologic activity of her particular tumor and whether or not it is within the limits of surgical excision. Since the overall cure rates for the past 20 years have remained about stationary, it would appear that the usual clinical criteria for determining operability are inadequate, and in many cases radical mastectomy is done when the disease is beyond its limits.

As early as 50 years ago the internal mammary and supraclavicular chain of nodes were recognized as sites of metastases and attacked surgically. However, this awaited the past decade before interest was generally revived. Investigation has been directed into two channels: one group has sought to extend radical mastectomy to include resection of the internal mammary and supraclavicular nodes; another group has biopsied the internal mammary, supraclavicular, and axillary nodes with the objective of limiting surgery on those individuals in whom the nodes are involved to simple mastectomy. It is our impression that the super-radical mastectomy is not indicated when the central nodes are uninvolved, and that when the disease has extended to these regions one has little chance of effecting a cure. Long-term results of the super-radical procedure may prove the operation to be beneficial, but at the present time we believe the conservative approach is indicated.

Handley,[3] whose father became interested in the spread of breast carcinoma to the internal mammary nodes at the turn of the century, reports a series of 150 consecutive cases in which he biopsied the internal mammary chain of nodes at the completion of radical mastectomy (Table 3). In 33% there were metastases to the internal mammary nodes. Fifty-four per cent of the medial and centrally placed tumors had invaded the internal mammary nodes, whereas only 16% of the lesions of the outer half of the breast had invaded the internal mammary nodes. When the axillary nodes were involved the internal mammary nodes were involved in 44 per cent. Hutchinson[4] (Table 3), in a similar series of 81 patients, found the internal mammary nodes involved in 25% of his cases, 20% in instances of lesions of the central and medial half and in 27% of lesions of the outer half of the breast. Forty-seven per cent of those patients found to have involvement of the axillary nodes had metastases to the internal mammary nodes. In only 2 cases were the internal mammary nodes involved alone.

The rate of metastases to supraclavicular nodes has been investigated by various workers. Dahl-Iversen and associates,[5] in two series, found them involved in 35 and 7% of those patients who had metastases to the

TABLE 3

RESULTS OF BIOPSY OF THE INTERNAL MAMMARY NODE

	Handley % Pos.	*Hutchinson* % Pos.
All cases	33	25
Axillary nodes positive	44	47
Central and medial tumors	54	20
Lateral tumors	16	27
Internal mammary nodes only	5	2

axillary nodes, the latter figure occurring in their more recent series of 100 consecutive cases. Internal mammary dissections were also done finding 32% involvement when axillary nodes were involved. All cases with supraclavicular metastases had lateral breast lesions and involvement of axillary nodes. Haagenson,[6] doing supraclavicular and internal mammary biopsies on about 100 cases, found the supraclavicular nodes involved in only two patients who did not have metastases to the internal mammary nodes. These data indicate that involvement of the supraclavicular nodes is an advanced stage of the disease occurring after metastasis to the internal mammary nodes. Biopsy of these nodes does not seem indicated when biopsy of the internal mammary nodes is done.

One surmises from these reports that in using present clinical criteria we are doing radical mastectomy needlessly in about 20 to 30% of cases. Ideally, biopsy of the internal mammary nodes is indicated in all instances in order to eliminate unfavorable cases. After permanent sections are reviewed by the pathologist a definitive procedure would be done. However, in applying the ideal to all cases, two main problems arise: (1) added cost to the patient is of particular concern in this day and time of tremendous hospital expense; (2) the psychologic and physical trauma of two general anesthetics and operations within a short period of time. In practice, it would seem reasonable to limit preliminary biopsy to those cases which are more likely to be positive according to the data at hand. These would be those lesions of the central and inner portions of the breast, those that have palpable axillary nodes, and tumors that have attained large size. While this plan of attack would not eliminate all unfavorable cases, it should eliminate a great number.

Summary

A small private series of carcinoma of the breast was reviewed with the finding that only 20% of those with axillary metastases obtained cures and 76% without axillary metastases were alive free of disease. While there is little hope of improving the over-all cure rate by surgery, data on biopsy of regional nodes indicates that from 20 to 30% of patients having radical mastectomy have metastases to central nodes. Biopsy of internal mammary nodes, when done on patients with clinical involvement of axillary nodes or tumors of the central and inner half of the breast, would eliminate needless radical mastectomy in many patients.

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Discussion (Abstract)

Dr. George B. Sanders, Louisville, Ky. Dr. Wilson and his father are to be commended for their efforts to improve their selection of candidates for radical mastectomy. The operation cannot cure, and rarely helps what it cannot physically encompass and extirpate.

With all of Dr. Wilson's ideas and conclusions, we would heartily agree, except that we still believe that biopsy of the apical axilla (not the supraclavicular fossa) is worthwhile as a complement to biopsy of the internal mammary chain. We have substituted apical axillary biopsy for supraclavicular fossa biopsy, following the suggestion of Haagensen who has felt that the situation of positive apex with negative supraclavicular biopsy does occur, and that an apex involved by cancer makes cure by surgery most unlikely.

We, too, have a small private series of breast cancer cases totaling 75 cases in a 9 year period.

Of these, 20 were evaluated by biopsy of the primary, clinical evaluation and skeletal x-ray survey, 4 by the above routine plus the addition of internal mammary node biopsy, and 51 by the further addition of "triple biopsy," and bone marrow biopsy. In this group of 55 cases where an internal mammary biopsy was part of the preoperative evaluation, 8 positive internal mammary biopsies were found. Since we adhere to the principle that cancer either in the apical axilla or in the internal mammary chain excludes the patient from radical mastectomy, and since 6 of these occurred in clinical Stage I cases, this has resulted in a reduction of operability, in our series, of only about 14 per cent. In Haagenson's monumental experience, recently reported, internal mammary biopsy has reduced operability by about 23 per cent.

In contrast to the reduction in operability thus reported, we have had the cheering experience that the procedure of triple biopsy has, in our small series, returned to the ranks of those potentially curable by radical mastectomy, 5 patients who, on clinical grounds might well have been relegated to palliation only.

Two of the 5 were patients with simultaneous bi-

lateral primary breast cancers in whom bilateral triple biopsies showed negative nodes, strengthening our belief that these were bilateral primary lesions and not local metastasis, and leading to the performance of simultaneous, two-team, bilateral, radical mastectomy for cure. Two other patients presented the problem of minute cancers in the wall of benign cysts, excised 1 to 5 years previously, with local recurrence only. In the first, negative, triple biopsy seemed to us to indicate that this locally recurrent cancer might be amenable to surgical cure by radical mastectomy and this was done.

In the other, the 5 year recurrence accompanied the appearance of a new nodule in the contralateral breast which appeared different histologically from the low-grade malignancy in the primary site. Bilateral triple biopsy showed negative nodes. The patient was a poor cardiac risk. We reasoned that bilateral radical mastectomy was too formidable and that it was probably not necessary for cure of the reluctantly recurrent primary in the original breast. We felt that radical mastectomy was necessary for the cure of the new, recent primary in the opposite breast which appeared to be growing vigorously. A bilateral mastectomy, radical on the "new or recent" side, and simple on the recurrent side was safely done.

The fifth patient refused radical surgery on religious grounds following excision biopsy of a small breast cancer 5 years previously. When it reappeared 2½ years later, and then, slowly growing to large size, threatened to ulcerate 5 years after original biopsy, she became convinced that operation was permissible and divinely indicated. Clinically, except for size and duration, it seemed localized and still confined to the breast. A negative triple biopsy indicated the possibility of complete removal by radical mastectomy, and this was done.

The "proof of the pudding," so to speak, is that the pathologist reported the axillas negative in all 5 cases, and that all 5 are still alive and well, 4 of them over 5 years after radical surgery.

I have enjoyed Dr. Wilson's fine paper, and greatly appreciate the privilege of discussing it.

The Present Status of the Treatment of Trigeminal Neuralgia*

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This is an excellent review of newer knowledge relative to the pathogenesis of tic douloureux and certain logical developments in treatment.

To EVALUATE the current methods of treatment of trigeminal neuralgia, one must understand the newest concept of its pathogenesis.[1,2] Only recently has a generally acceptable explanation of the etiology and mechanism of the disease evolved. In 1951, Shelden and associates[3] had considerable success when they began to investigate the possibility of curing neuralgia by opening the skull and, with a dental drill, enlarging the foramen ovale or foramen rotundum on the theory that the nerve might be compressed at these points. At about the same time, Taarnhøj[4] discovered that surgical "decompression" of the sensory root of the trigeminal nerve resulted in relief of the neuralgia for an undetermined period. Both of these operations caused little or no loss of sensation in the face. Since these manipulations of the nerve at different levels produced the same beneficial result, it eventually became apparent that the common denominator was trauma to the gasserian ganglion or sensory root and that any type of injury to these structures, clinically detectable or undetectable, was likely to produce temporary, or perhaps permanent, disappearance of the attacks of neuralgia. Still later, several authors postulated that the greater the damage done, as manifested by patches of decreased sensibility in the trigeminal domain, the less likely that the pain would recur.[5-7] The name of the operation thus changed to the "compression" procedure, the "decompression-compression" procedure or "gasserian gangliolysis."

In view of this theory, it is possible to understand Jaeger's[8] success in relieving neuralgia by the injection of hot water into the ganglion, often with a minimal loss of sensation. Furthermore, the exceedingly high degree of reliability of the old standard operation known as differential (partial) section of the sensory root is also explained.

The next step in understanding trigeminal neuralgia was made by Crue and associates,[9] who postulated that the pain is central in origin, probably in the upper part of the cervical spinal cord, where the descending nucleus and tract of the trigeminal nerve are located, in close relationship with the incoming sensory fibers of the upper cervical roots. This seemed to explain the occasional occurrence of trigger zones in the upper cervical dermatomes and the temporary relief of neuralgia sometimes obtained by section of the great auricular nerve or the greater occipital nerve.[9-11] More recently, List and Williams[1] concluded, from an analysis of all existing facts and theories, that the mechanism of trigeminal and glossopharyngeal neuralgia represents a pathologic, multineuronal reflex in the trigeminal system of the brain stem. Specifically, afferent stimulation (tactile or proprioceptive) of trigeminal and occasionally high cervical receptors evokes a pathologically increased, delayed response in the trigeminal nucleus. From there, efferent impulses are conducted back to the periphery, where they reverberate and excite the central trigeminal connections. This process of self-exciting, repetitive after-discharge continues until the firing neurones become refractory. List and Williams suggested that the abnormal overexcitability may be due to metabolic changes in the ganglion cells of the trigeminal nucleus.

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Since the pain of tic douloureux must be evoked by afferent impulses to the central trigeminal apparatus, it is reasonable to assume that the fewer the afferent impulses, especially noxious ones, the less the abnormal excitability of the central nucleus. Improvement in peripheral conditions, such as dental disease, could thus account for the remissions that characterize neuralgia. Finally, the occasional association of trigeminal neuralgia with tumors adjacent to the nerve and with multiple sclerosis suggests that such patients were only inclined toward tic douloureux and the disease probably would not have developed had the gross lesions not deluged the central apparatus with a certain type of abnormal afferent impulse.

Medical Treatment

In view of the theory that trigeminal neuralgia is due to metabolic changes in the neurons of the central nucleus, it is not surprising that vitamin B has proved effective in causing prolonged disappearance of the paroxysms of pain. Since Fields and Hoff[12] advocated large doses of vitamin B_{12} in 1952, most victims of the disease in this country have received one or more courses of it. It is customary to give 10 daily intramuscular injections of 1,000 mcg. each. This can be supplemented by oral administration of vitamin B_1 and nicotinic acid. If prolonged remission of pain is obtained, the patient will eventually seek another course of treatment.

In view of the demonstrated fact that slight trauma to the trigeminal apparatus interrupts the arc of the pathologic reflex and brings about temporary, if not permanent, relief from neuralgia, it is easy to understand why stilbamidine, which causes sensory loss in the face, has proved useful. Since its introduction by Smith and Miller,[13] they and others[14,15] have demonstrated that tic douloureux can be controlled by its intravenous use and that courses of treatment can be repeated as needed. Stilbamidine, however, does not appear to be an entirely satisfactory answer to the problem because of the deferred action of the drug and the development of unpleasant paresthesias in a small percentage of patients.[14]

Other medical measures for the control of tic douloureux have been suggested by King,[16] who produced tic-like states in cats and determined the influence of various substances on their trigeminal nerve potentials.[17] Mephenesin (Tolserol) is one of the more effective preparations tested. Diphenylhydantoin sodium (Dilantin), although less effective, had a similar influence. Whether or not Dilantin, Tolserol and Tolseram (mephenesin carbamate) will prove of real value in the control of tic douloureux must await longer trials of investigation of these drugs, which have been started by King,[16] Sperling and Stender,[18] Iannone and co-workers,[19] and others.

Peripheral Neurectomy

As recently re-emphasized by Grantham and Segerberg,[20] alcoholic injection or surgical section of appropriate peripheral branches of the fifth cranial nerve continues to play a major role in the treatment of neuralgia. Surgical or chemical interruption of the supra-orbital, infra-orbital, inferior alveolar, lingual, and mental nerves often enables patients to postpone definitive treatment for many years. The same statement could be made about alcoholic injection of the maxillary and mandibular divisions, but many surgeons find these procedures too painful for the patient.

Definitive Surgical Treatment

Destruction of the sensory root or gasserian ganglion by whatever method used can be counted on to produce permanent anesthesia of the face and permanent relief from neuralgia. Surgical section or partial section of the sensory root has always been popular in this country, but in England the chief interest has always been in alcoholic injection of the ganglion. Recently, in this country Ecker and Perl[21] perfected an exacting technic for safely destroying the ganglion with absolute alcohol. Under roentgenographic control the point of the needle is passed through the foramen ovale and comes to rest among the ganglion cells. The alcohol is injected extremely slowly and the development of anesthesia is carefully charted. Using a somewhat similar technic, Jaeger[8] injected hot water rather than alcohol on the theory that it is safer and causes less sensory deficit. As mentioned earlier, relief of pain without production of an anesthetic face is consistent with the new discovery that mild surgical trauma to the ganglion can provide years of relief from neuralgia.

Injection of hot water, unless it is used to produce profound anesthesia of the face, must be classed with the "decompression-compression" operation as one that cannot guarantee a permanent cure.

"Decompression-Compression" Operation

The operation of Taarnhøj and its numerous modifications are not going to replace completely the old procedure in which the sensory root is completely or partially severed, but it should be offered to the majority of patients with severe trigeminal neuralgia. However, the patient must understand the facts and be prepared for a possible second operation, perhaps only months later.

We first tried Taarnhøj's operation on June 30, 1953, and had performed 18 by the end of 1956. Approximately an equal number of sections of the sensory root were done during the same period. Before operation, the neuralgia had been present from 6 months to 18 years, with an average duration of about 7 years. The average age of the 18 patients was 53 years. This is low because the older patients were encouraged to choose partial or complete section of the sensory root. Seventeen of the 18 patients were operated on with use of a local anesthetic. The average duration of postoperative hospitalization was four and a half days. All but one had some patchy sensory loss in the face postoperatively. Three had recurrences of tic douloureux that required a second operation by us four and a half years, 2 years and 1 year later. During the month of October, 1958, we talked with all 18 patients on the telephone and all were well, working and free of neuralgia. The average follow-up period for the 15 who had only one operation was 39 months. Eleven of these patients still describe small patches of numbness on the face. Only one admits unpleasant paresthesias in the hypalgesic area.

Discussion

In view of our rewarding experience with the decompression-compression operation, we are now recommending this procedure to most patients who are no longer kept reasonably comfortable with medical treatment and neurectomy of peripheral branches. We do not recommend injection of the gasserian ganglion, maxillary division, or mandibular division except under unusual circumstances.

Conclusions

We subscribe to the recent theory that metabolic changes in the trigeminal nucleus in the lower brain stem cause trigeminal neuralgia. The paroxysms of pain represent a pathologic, multineuronal reflex that is evoked by afferent impulses from the trigger zone on the skin or mucous membrane. Any method that tends to improve the metabolic state of the trigeminal nucleus or interrupts the arc of the pathologic reflex is apt to provide relief.

The therapeutic value of vitamin B_{12} and stilbamidine are explicable in view of this theory; we prefer the former to the latter. Other agents now undergoing clinical trial include mephenesin, diphenylhydantoin sodium and mephenesin carbamate. Neurectomy of peripheral branches usually results in control of the disease in its early stages. Injection of the mandibular or maxillary divisions and injection of the gasserian ganglion are also effective but seldom used by us. The decompression-compression operation, which causes disappearance of the neuralgia without producing more than patchy numbness of the face, has been so satisfactory that we recommend it to most patients who are no longer relieved by medication and peripheral neurectomy.

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Role of the Electrocardiogram in the Differential Diagnosis of Acute Chest Pain*

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At times all possible aid is needed in the differential diagnosis of pain referred to the chest. Though much in the diagnosis depends upon the history and the examination, help may be offered by the electrocardiogram.

THE MOST ACCURATE MEANS of making a specific diagnosis when a patient is seen with acute pain in the chest is the history and physical examination, but a valuable adjunct is the electrocardiogram. Like all laboratory disciplines electrocardiography has certain limitations. Some of these can be overcome by use of special technics, such as simultaneous leads[1] and supplementary leads.[2] Equally important is the realization that in some cases, however, the electrocardiogram cannot be relied upon for aid in diagnosis. The proper role of the electrocardiogram in specific diseases causing acute pain in the chest will be considered in this discussion and illustrative examples will be cited.

Angina Pectoris

Of basic importance in the electrocardiographic diagnosis of angina are two facts. First, the changes are transient. Second, the cardinal change of acute subendocardial ischemia (the usual cause of angina) is ST depression or sagging, not T-wave inversion[2,3] (Fig. 1). Because of the evanescence of the electrocardiographic change, the electrocardiogram is of value primarily during an episode of pain, either spontaneous or induced by a standard exercise test.

The indications and technic for the exercise test will not be discussed since they are well-known. It is perhaps well to emphasize that the post-exercise leads should be chosen individually for each patient, the choice being based on suspicious leads in the resting tracing or, lacking these, on those resting leads that reflect primarily left ventricular potential. It is also well to remember in interpretation that T-waves inverted after exercise are not necessarily due to myocardial ischemia, and that ST-segment depression is more specific.[2,4] Hyperventilation, such as occurs after any exercise, commonly results in inversion of the T-wave in young people, and if this is the only change, one should examine the same patient after hyperventilation without exercise (Fig. 2).

One of the most reliable, and too often neglected, examinations is electrocardiography during an episode of spontaneous pain in the chest (Fig. 3). Since this pain lasts only a few minutes, it is difficult to obtain such a record unless its occurrence can be anticipated. This is often possible if one takes a careful history, eliciting from the patient the specific events likely to produce pain (for example, meals or visiting hours). Even in patients in whom the history of angina is diagnostic, a tracing during pain is valuable for several reasons. First, it documents the event for future reference, since the electrocardiographic findings are rarely, if ever, normal during pain. Second, it may disclose arrhythmias that occur during pain, of which neither the patient nor the physician were aware, and whose anticipation enables more intelligent therapy (Fig. 4). Third, it may disclose conduction disturbances, such as atrioventricular block, which not only are well to know in planning therapy but also can be used in localizing anatomically the lesion in the coronary tree; for example, atrioventricu-

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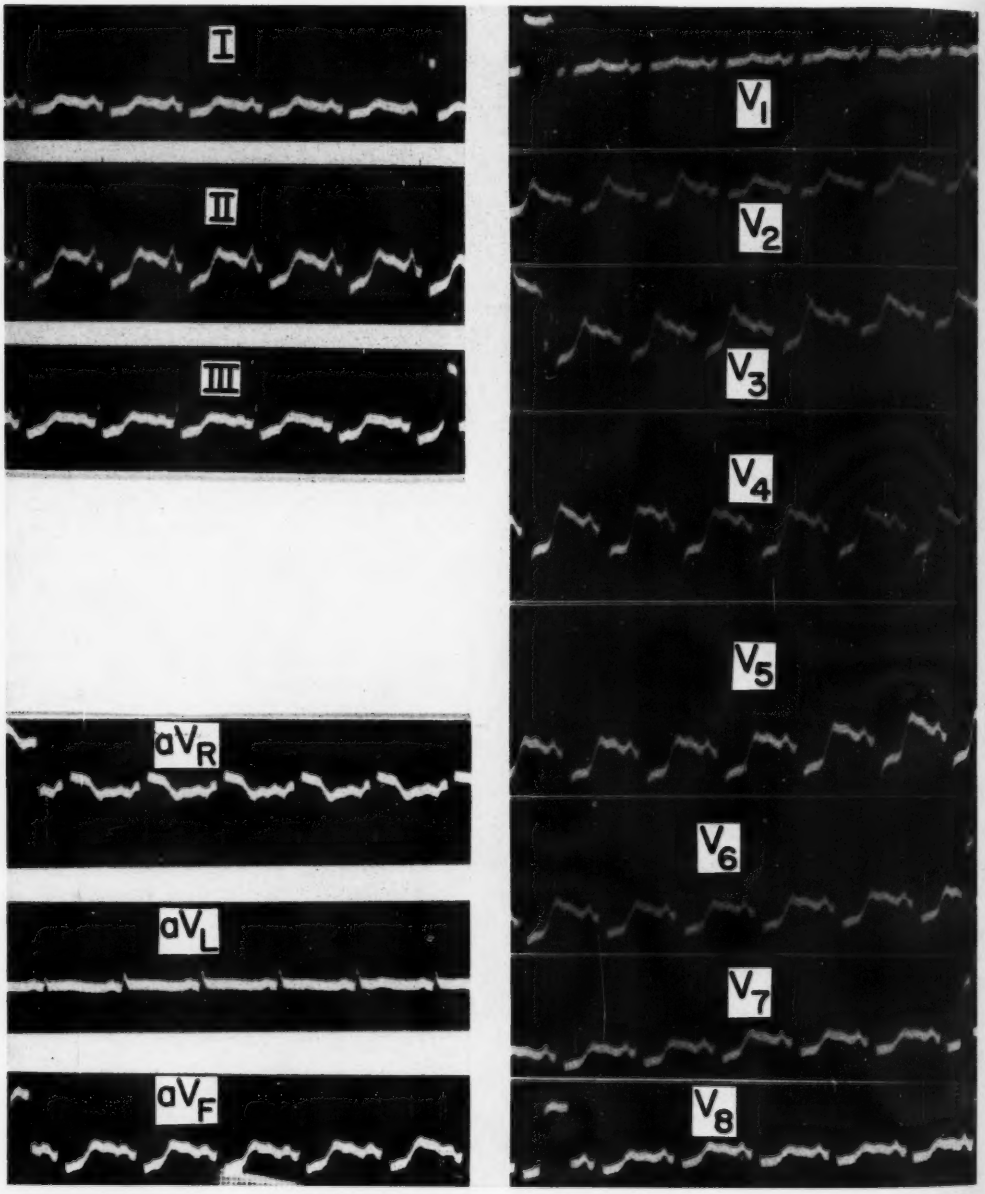
FIG. 1

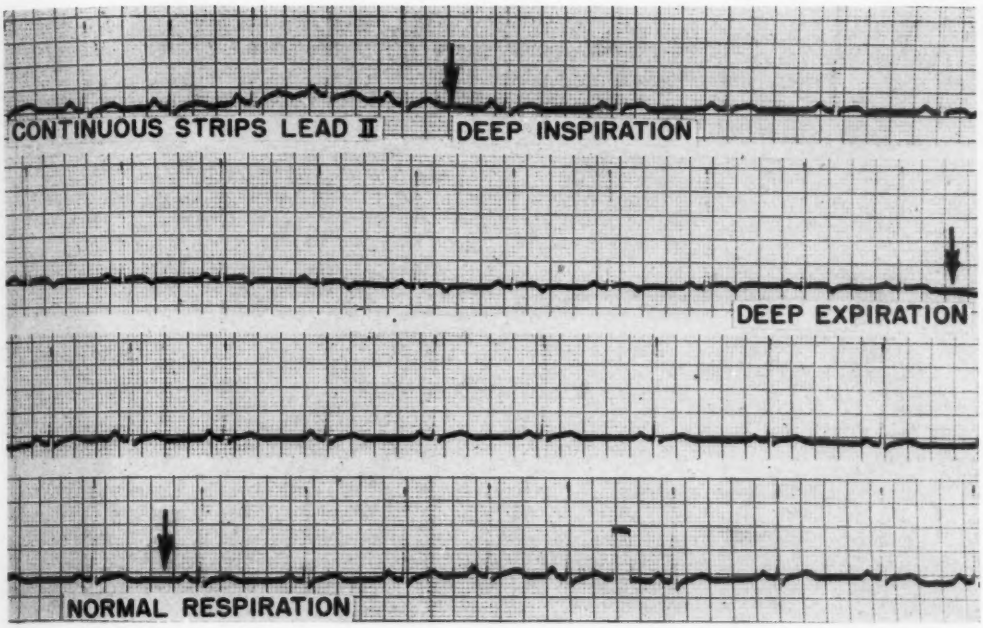


Changes of diffuse acute subendocardial ischemia in a white woman 65 years old in shock after cerebral hemorrhage; at necropsy left ventricular hypertrophy was noted but myocardial infarction and coronary occlusion were not seen. Note absence of any reciprocal changes to the generalized ST-segment depression (except in cavity-lead aVR); compare with figure 6.

lar block is almost always an expression of ischemia of the posterior wall, which in turn is, in 90% of cases, due to a proximal lesion of the right coronary artery (Fig. 5).

Although ST depression is the usual expression of subendocardial ischemia, rarely ST elevation does occur. This indicates transmural ischemia, involving the epicardium,

FIG. 2



Respiratory maneuvers after three minutes of hyperventilation in a Negro man 20 years old with no heart disease. Note nonpathologic T-wave inversion.

and is probably of more immediate significance. Recently, an unusual syndrome of such a change occurring during spontaneous pain at rest, frequently associated with ventricular arrhythmias, and not reproducible by exercise, was described under the name of "angina pectoris inverse."[5] In all cases reported the the condition progressed eventually to infarction, which occurred electrocardiographically in the same region as the preceding ST elevation. Why it could not be reproduced by exercise is not explained. In a similar case at our hospital infarction also eventually occurred (Fig. 4).

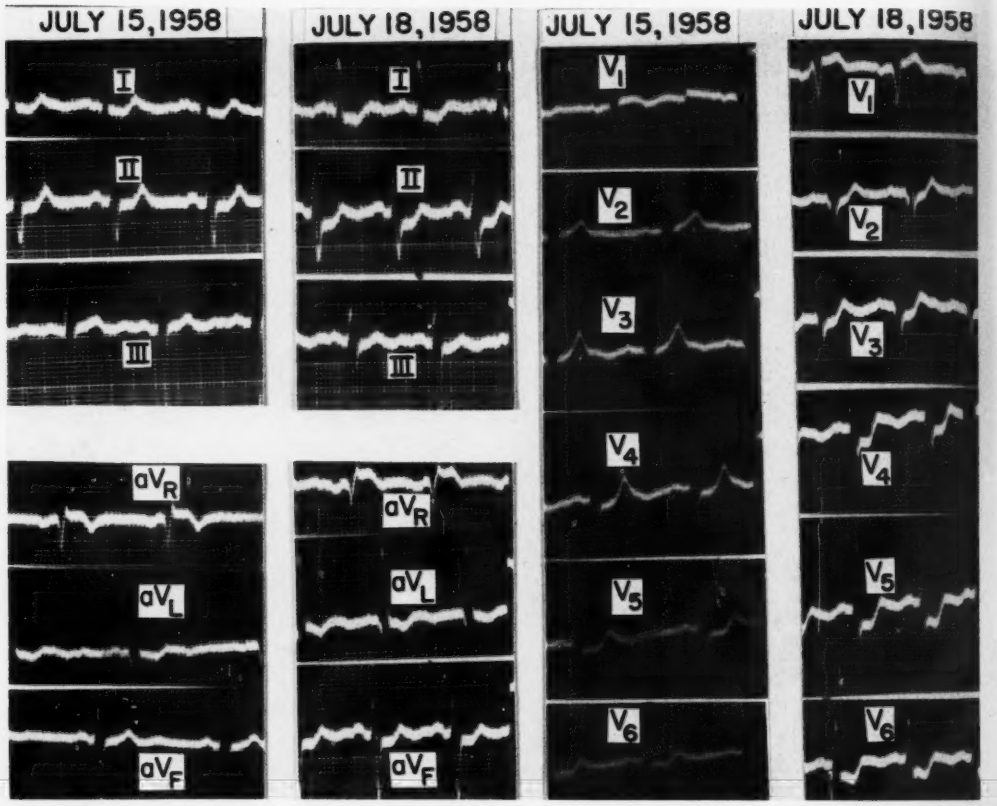
Myocardial Infarction

The electrocardiographic difference between angina and infarction may be briefly outlined. Acute transmural infarction is characterized by ST elevation over the injured area rather than depression, and reciprocal ST depression over the contralateral wall; reciprocal changes either do not occur or are only minimal during angina (Fig. 6). The changes of infarction are sustained and progressive whereas those of angina are transient, quickly returning to normal or to minor nonspecific T-wave inversion.

Misleading or nonspecific electrocardiograms occur most frequently with small intramural or subendocardial infarctions. Infarction may also be masked by previous electrocardiographic abnormalities, such as left bundle branch block. In all these circumstances serial tracings are of great value, often pointing up the significance of changes that alone would be considered of little or no consequence. Such changes enhance the value of the electrocardiogram, since it has been shown that inclusion of these minor abnormalities makes the electrocardiogram approximately 98% positive in infarction.[6,7]

Among small infarctions the ones most likely to be overlooked are high lateral and high posterior ones. High posterior infarcts may escape diagnostic representation in either standard lead III or aVF, being located at the crux of the heart. Leads most likely to demonstrate the diagnostic changes are V_8 and V_9, or esophageal leads (Fig. 7). Small, high, lateral infarcts are almost always suggested in leads I and aVL, but the changes there

FIG. 3



Two electrocardiograms of a man, aged 68 years, with atherosclerotic heart disease (taking digitalis), chronic coronary and myocardial insufficiency, functional post-prandial dyspepsia and cervical arthritis. The second tracing, taken during pain after lunch, shows that the clinically confusing pain was due to myocardial ischemia.

again may not be diagnostic; high leads HV_1 through HV_6 in such cases are of most value (Fig. 8).

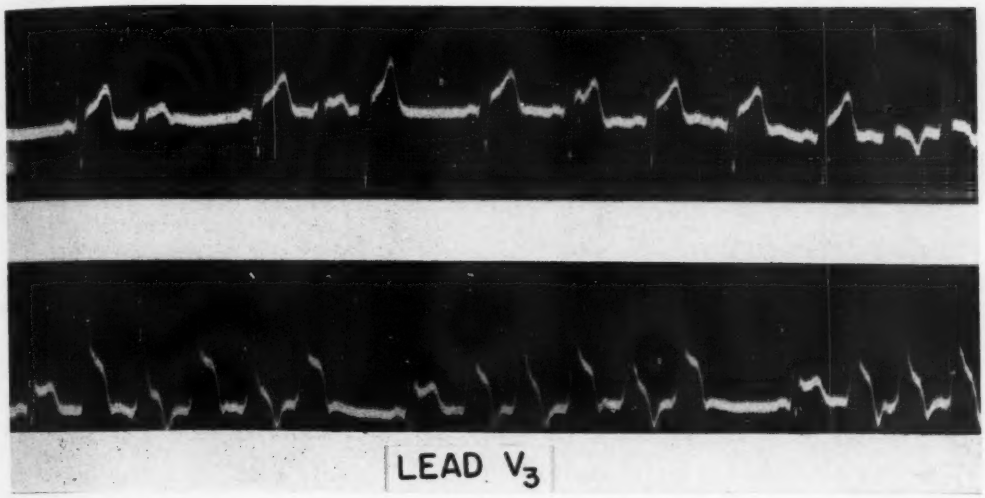
Pulmonary Embolism

The value of the electrocardiogram in the diagnosis of pulmonary embolism is commonly overlooked or underestimated. The changes produced, though transient, are often pathognomonic. These consist of the results of acute right ventricular hypertension, which are dilatation and strain, and of acute left ventricular ischemia; secondarily, right atrial dilatation and strain may produce typical P pulmonale changes in leads 2, 3 and aVF.

In the limb leads right ventricular dilatation is expressed by changes in the electrical position of the heart to right axis in the bipolar limb leads and vertical in the unipolar extremity leads (Fig. 9, A and B). T-wave inversion in leads 3 and aVF, probably the result of both right ventricular strain and left ventricular ischemia, sometimes suggests at casual inspection posterior infarction. This may be differentiated by the lack of primary changes in the QRS complexes.

In the unipolar precordial leads right ventricular dilatation is expressed by a shift of the transition zone to the left, and by delayed activation of the right ventricle. The latter is of variable degree and duration but may produce complete right bundle branch block. The shift of the transition zone to the left may be so pronounced that all the six standard precordial leads may resemble V_1, i.e., reflect right ventricular potential. In such cases supplementary leads V_7 to V_9 will usually demonstrate the transition zone and

FIG. 4

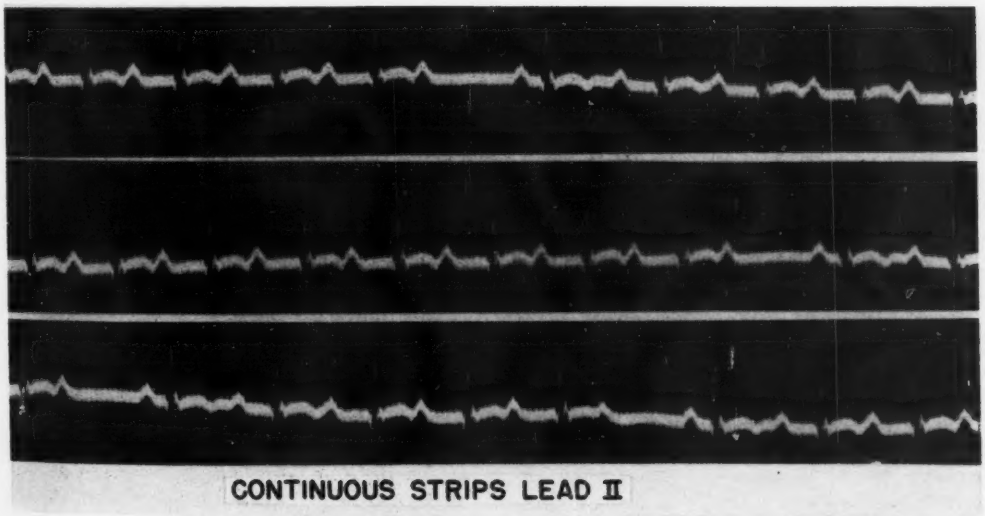


Bizarre arrhythmia and ST-segment changes of acute epicardial (or transmural) injury in a white man 49 years old with atheosclerotic heart disease. The conventional EKG. showed no abnormalities up to the recording of V_2, when the patient experienced anginal pain; after the pain subsided, the electrocardiographic findings were again normal. Three days later the patient had a small anterior infarction, principally shown in leads V_2-V_4.

the electrical position of the left ventricle. Supplementary leads V_3R and V_4R are useful in defining delayed activity of the right ventricle, sometimes showing R′ waves when V_1 and V_2 fail to do this.

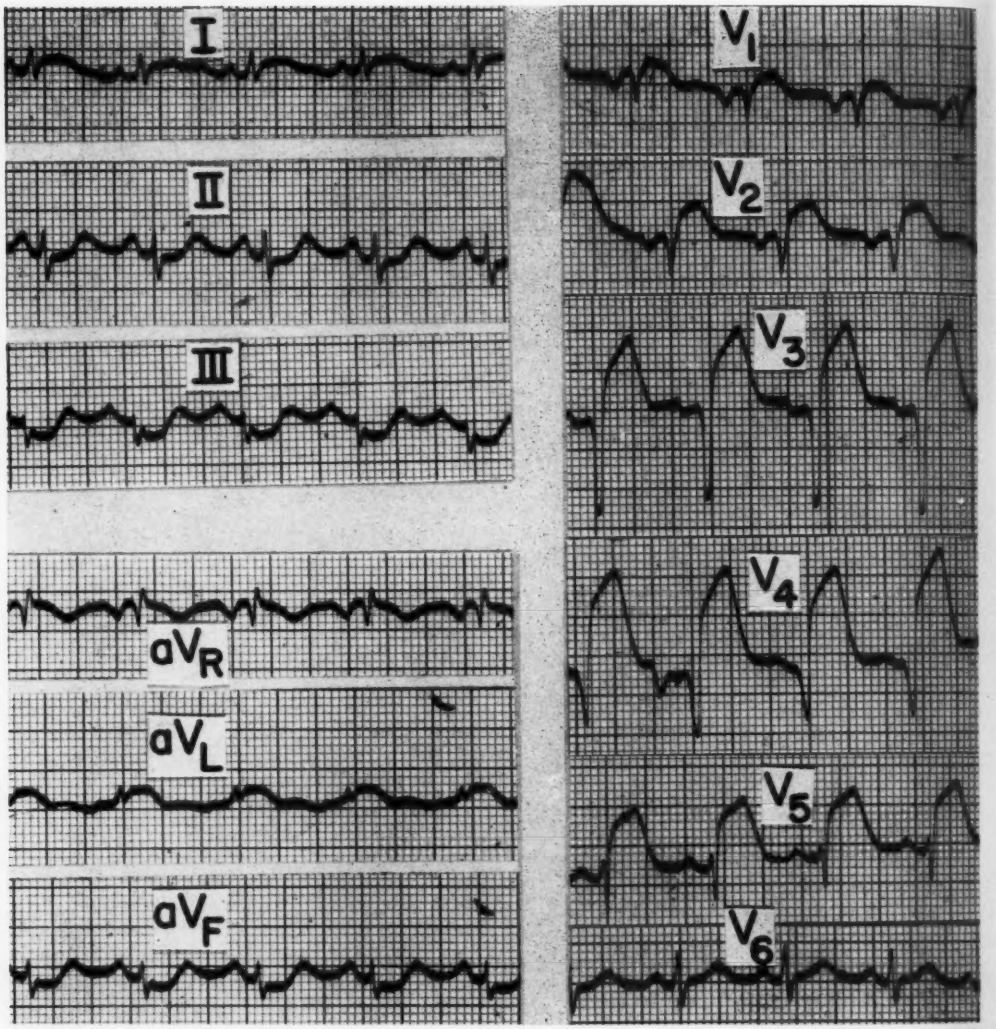
Right chest leads and V_1 to V_3 most commonly show right ventricular strain, expressed by T-wave inversion, and are particularly valuable if in comparison with previously normal tracings this is shown to be new. Left ventricular ischemia is expressed in the same fashion as in angina due to coronary disease. It is extremely valuable for the physician, in interpreting all the changes of pulmonary embolism, to have a normal previous tracing for comparison, which makes it worthwhile

FIG. 5



Varying degrees of atrioventricular block in a white man 50 years old with acute posterior myocardial infarction.

FIG. 6



EKG. of a white man 52 years old, with acute anterior myocardial infarction; note reciprocal ST-segment deflections in leads I and III, aVL and aVF, characteristic of acute infarction as compared with ischemia without infarction (Fig. 1). At necropsy the left anterior descending artery was thrombosed and anterior left ventricle and septum were infarcted.

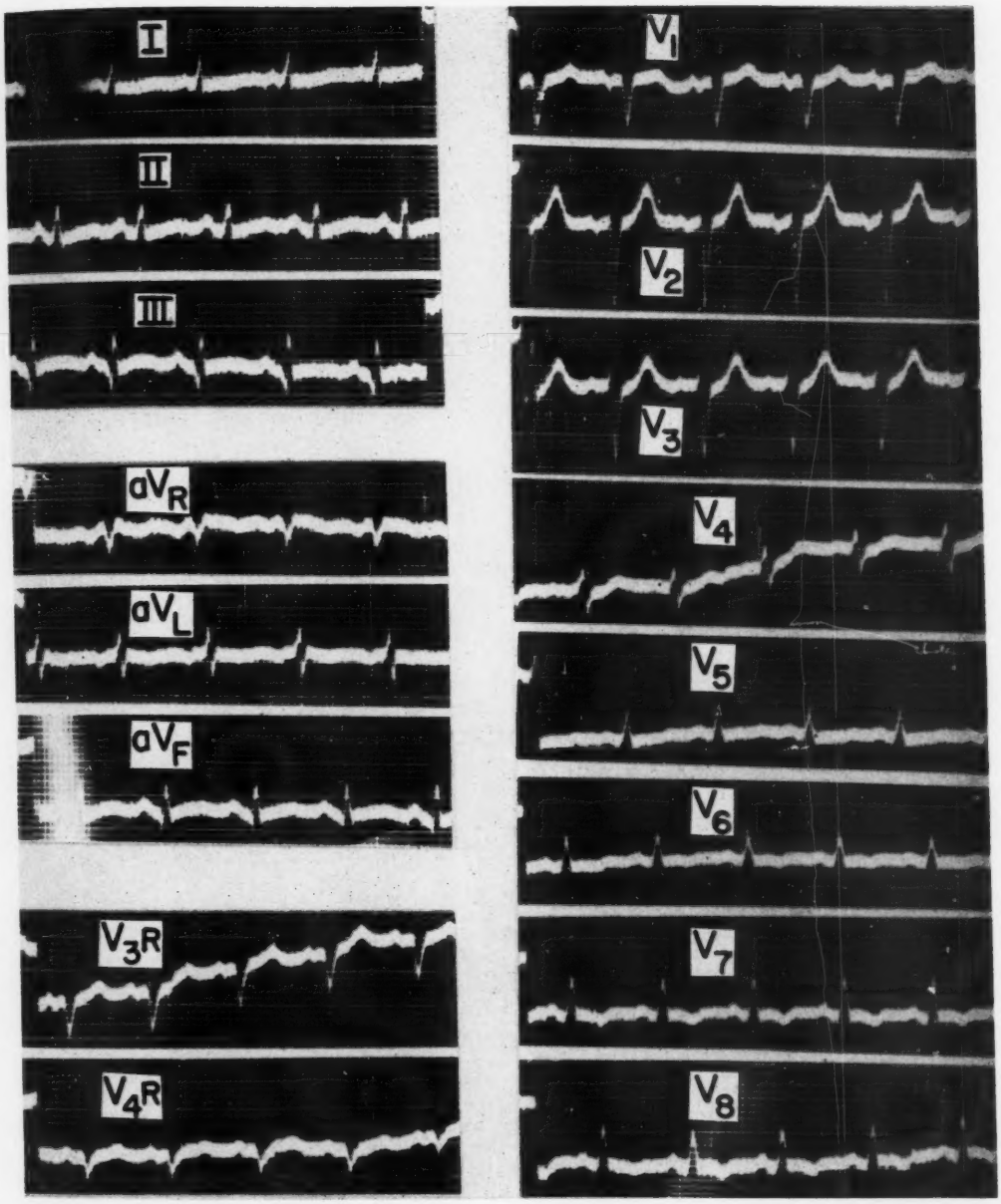
to have preoperative electrocardiograms for almost all surgical patients.

Reasons for nondiagnostic changes in the electrocardiogram in pulmonary embolism include small emboli, tracings taken after the acute right ventricular hypertension has subsided, insufficient supplementary leads, and extensive previous electrocardiographic abnormalities. If the changes are of questionable significance and no known normal previous tracings are available, the value of serial examinations, utilizing the evanescence of changes due to pulmonary embolism, must not be forgotten (Fig. 10, A and B).

Pericarditis

The value of the electrocardiogram in the acute phase of chest pain due to pericarditis is variable and helpful much less often than in the previously discussed diseases. Changes of pericarditis electrocardiographically sometimes lag many days behind the appearance

FIG. 7

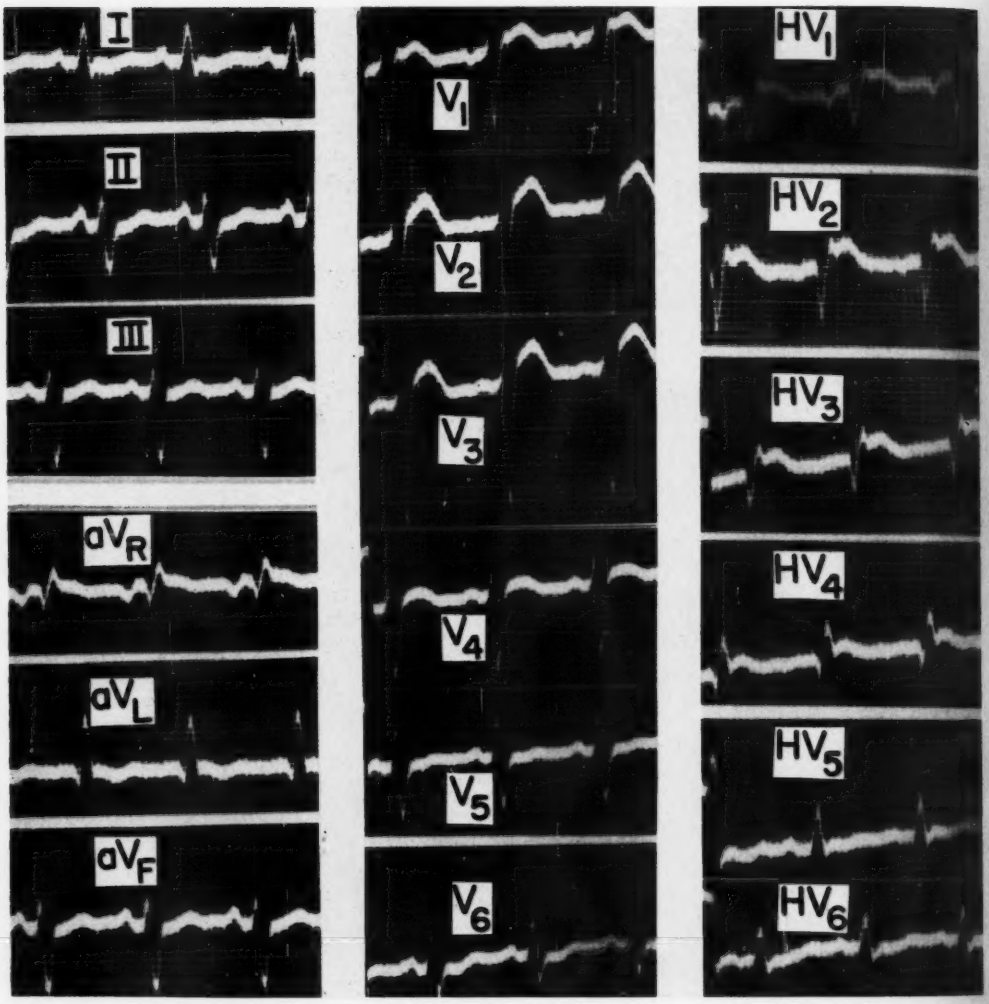


A small high posterior myocardial infarction in a diabetic white woman 67 years old. The diagnosis may be suspected from leads III, aVF and V_8, but is confirmed by V_7 and V_8.

of a pericardial friction rub or the onset of typical pain, and frequently do not appear in the electrocardiogram at all. It is a fallacy to withhold the diagnosis of pericarditis solely because of the lack of electrocardiographic changes.

Since the subject of this discussion is acute chest pain, the electrocardiographic changes

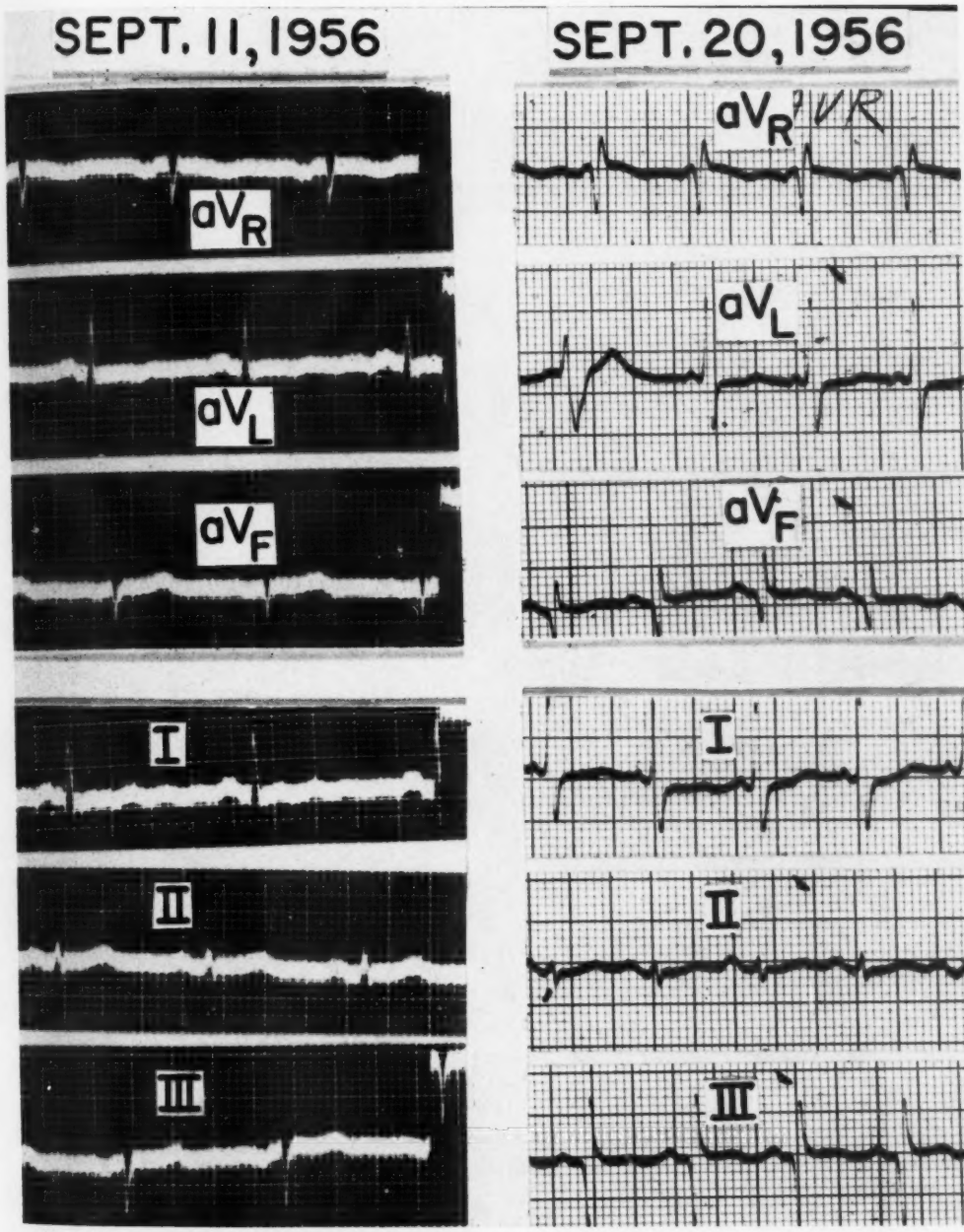
FIG. 8



High lateral leads HV_1-HV_4 demonstrating fatal high anterior infarction in a white man 54 years old. Of the conventional leads only aVL suggests infarction.

in the subacute phase of pericarditis will merely be mentioned; these are nonspecific generalized T-wave inversions without ST-segment deviation, and are sometimes misinterpreted as "ischemia" (Fig. 11). When present in the acute phase of pericarditis the diagnostic changes, which are a reflection of epicardial injury (and hence the converse of changes due to subendocardial injury)[2, 3] consist of ST elevation over the area of injury. Unless the epicardium is involved, electrocardiographic changes do not occur. This is probably the reason for normal electrocardiograms in many patients with involvement only of the pericardium. Since the process is usually generalized, the electrocardiographic changes of pericarditis are usually diffuse. They are specifically not associated with reciprocal changes of a contralateral wall, which serves to differentiate them from acute infarction; additionally there are no changes in the QRS complex, unless pericardial effusion has occurred, in which case the complexes may be of low voltage.

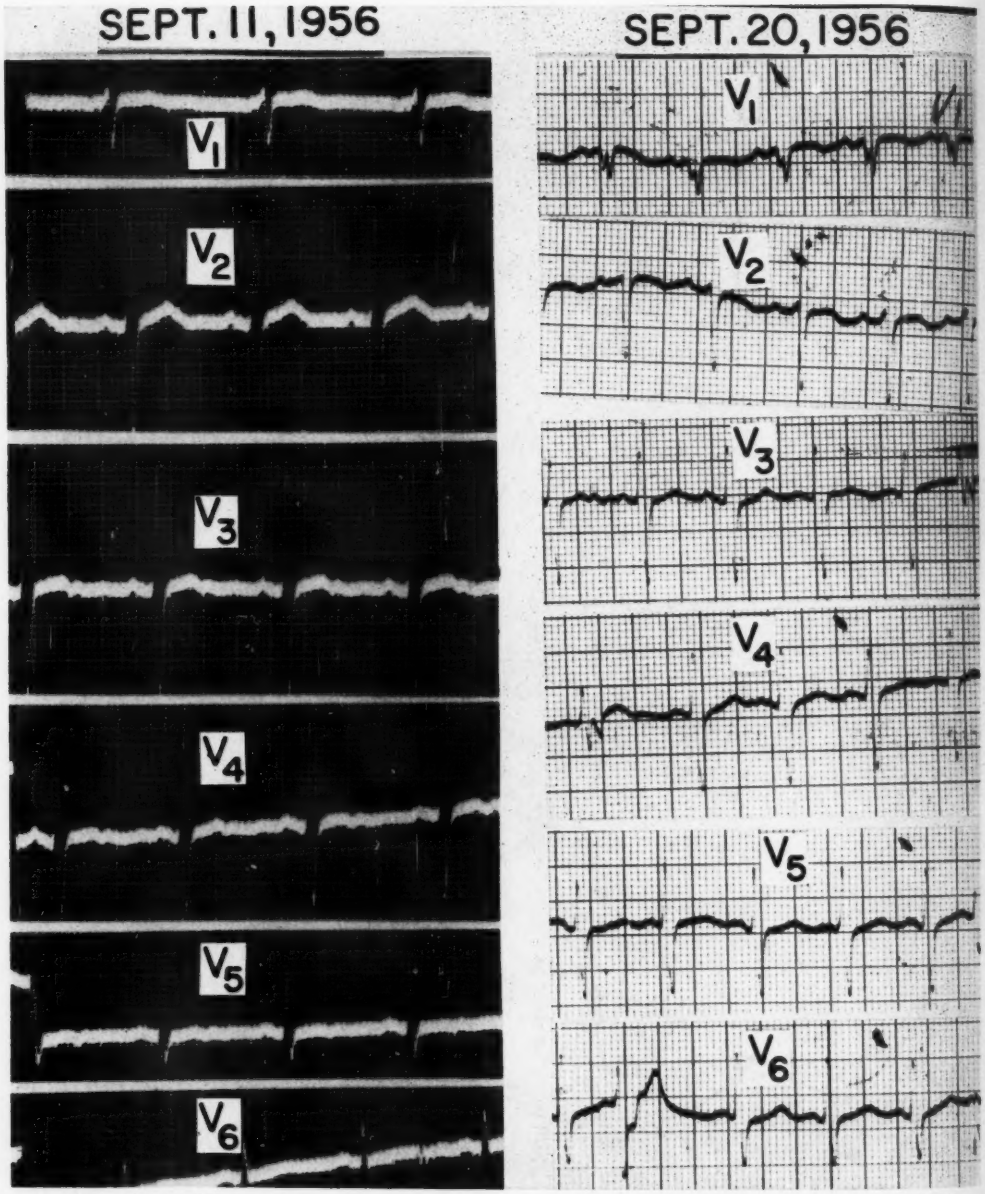
FIG. 9, A



(A and B) Electrocardiograms of an obese man, 52 years old, who had an acute pulmonary embolism (necropsy) after hemorrhoidectomy. The second tracing, 2 hours after occurrence of the embolism, shows particularly right bundle branch block, shift of the electrical axis to the right, and shift of the precordial transition zone to the left.

The zone of epicardial injury due to pericarditis is comparatively small, except in certain necrotizing diseases, such as lupus erythematosus, and the degree of ST elevation is proportionate to this zone. Consequently, persistent ST elevation or extreme elevation

FIG. 9, B



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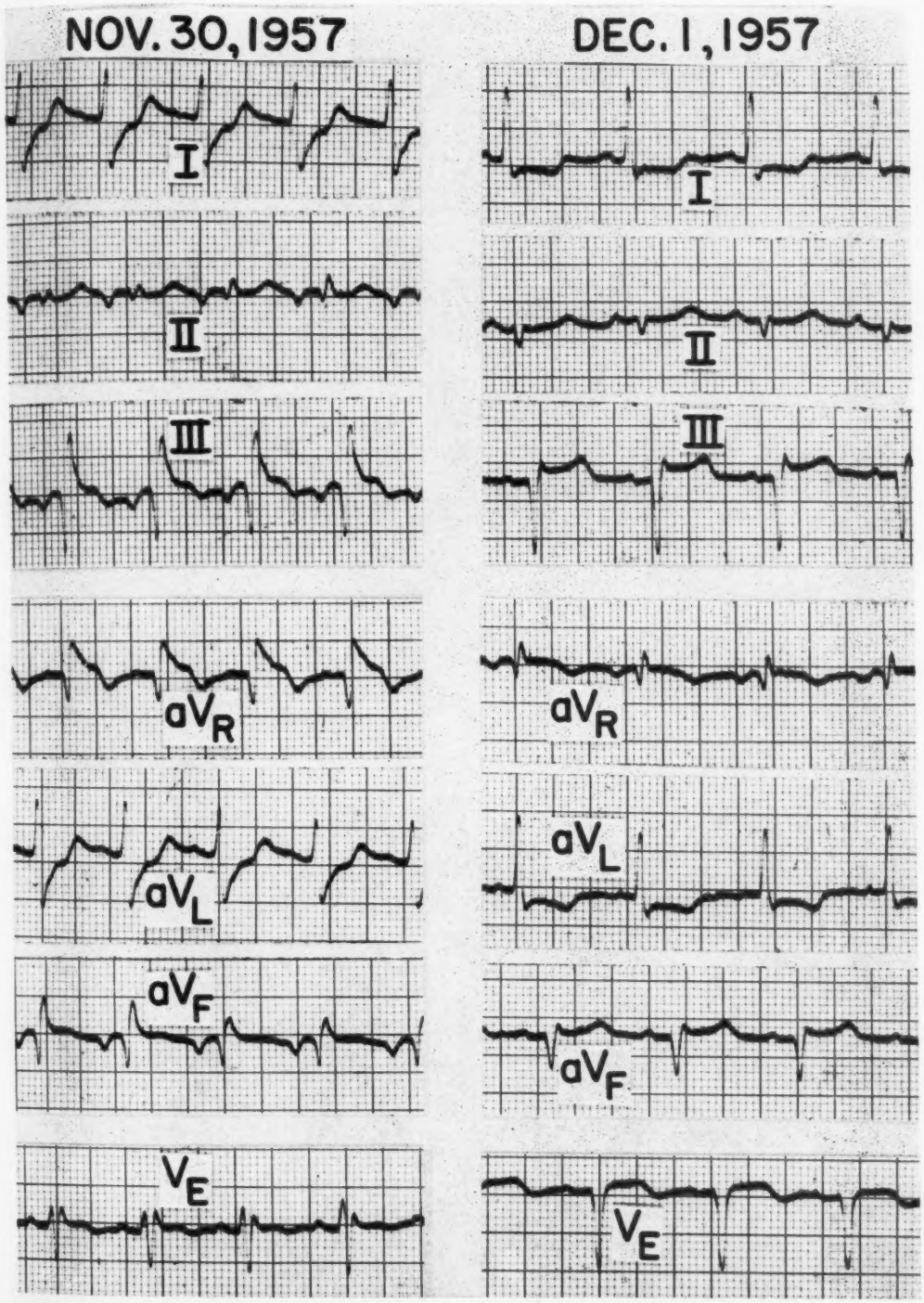
should always suggest that the epicardial injury may be part of a transmural infarction.

Dissecting Aneurysm

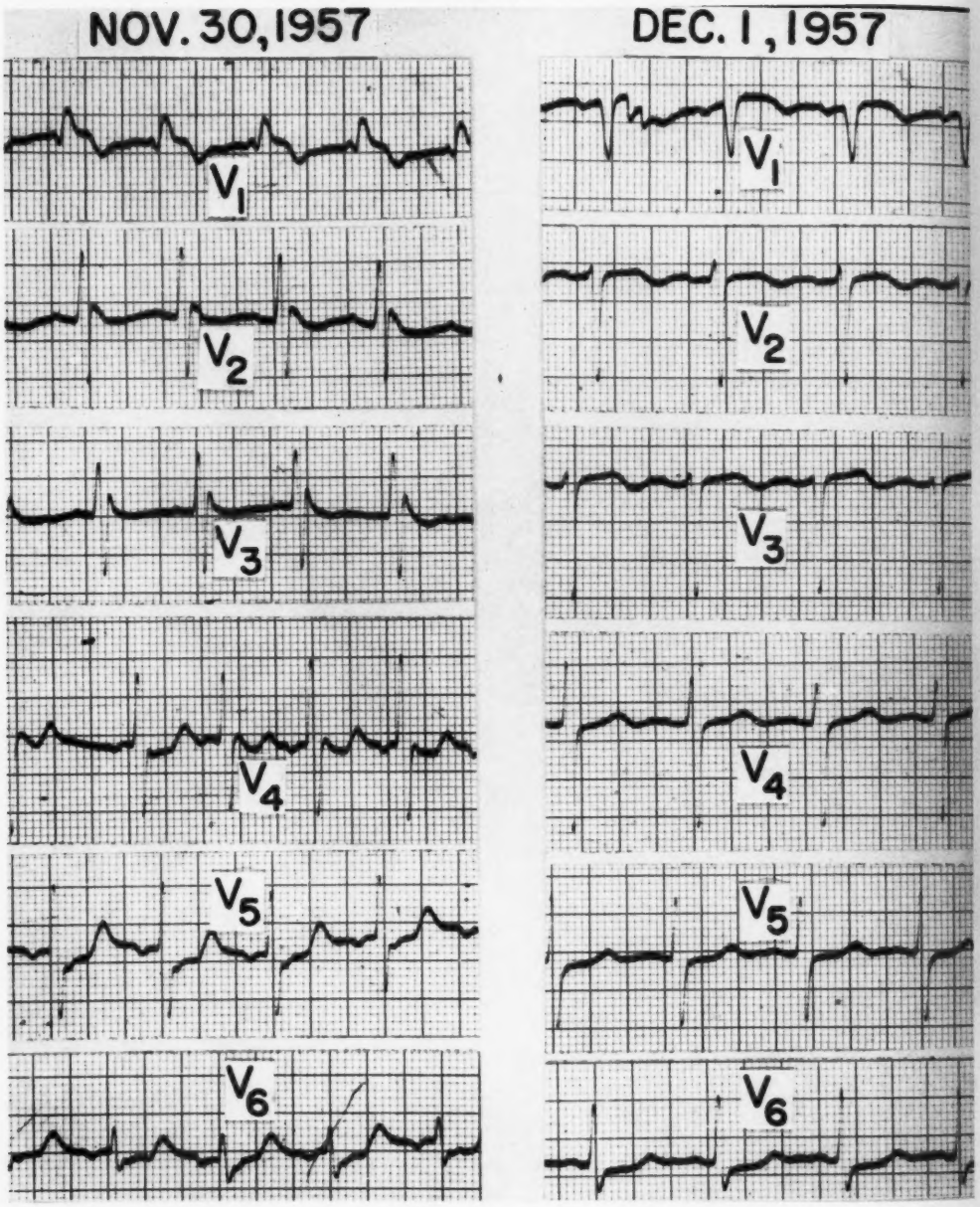
The chief value of the electrocardiogram in this disease is that it is usually normal. Thus, in a patient with severe chest pain of prolonged duration and a normal electrocardiogram, especially if he is hypertensive, dissecting aneurysm should be a prime considera-

FIG. 10, A



(A and B) Electrocardiograms on 2 successive days in a 75 year old, white woman, seen for the first time during an acute pulmonary embolism. Rapid regression of the acute initial changes, rather than progression, is typical of acute cor pulmonale due to embolism and helps to differentiate it from myocardial infarction. Diagnosis was confirmed at necropsy.

FIG. 10, B

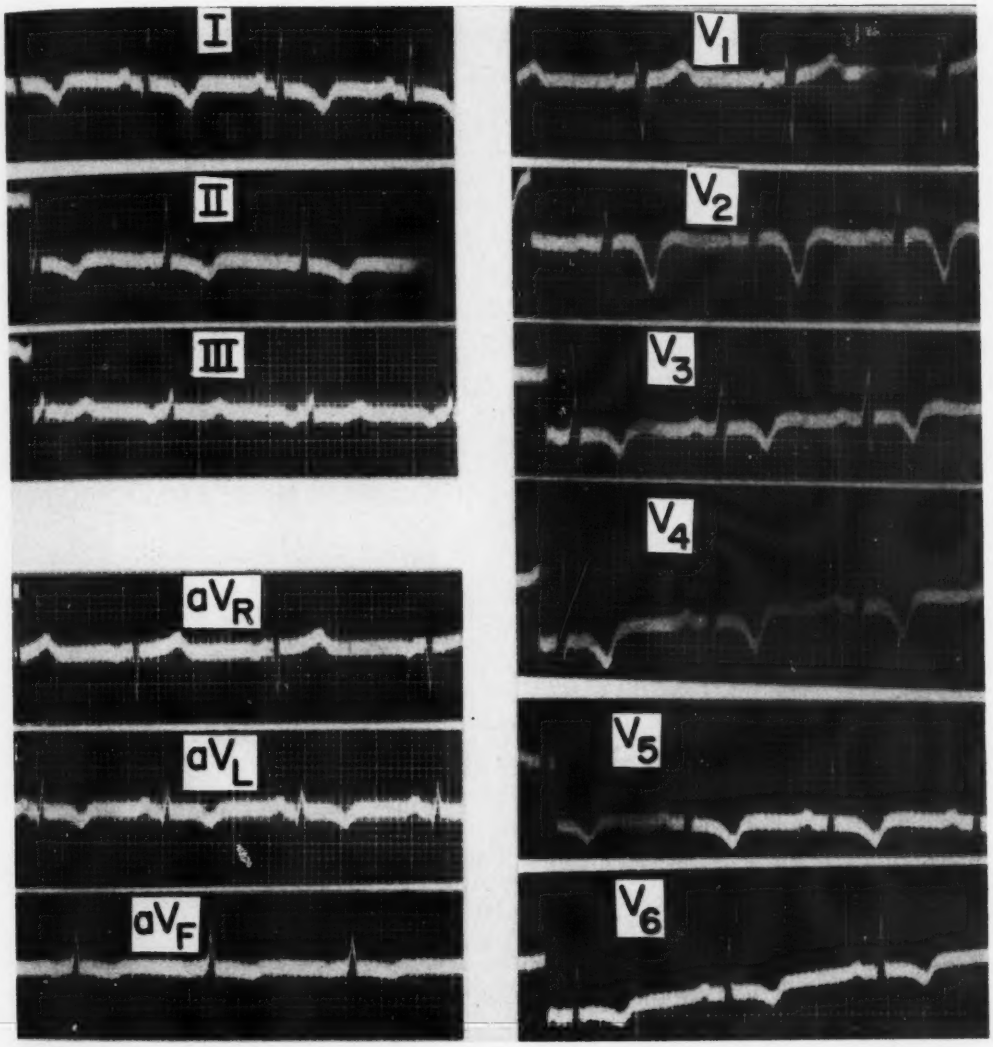


(A and B) Electrocardiograms on 2 successive days in a 75 year old, white woman, seen for the first time during an acute pulmonary embolism. Rapid regression of the acute initial changes, rather than progression, is typical of acute cor pulmonale due to embolism and helps to differentiate it from myocardial infarction. Diagnosis was confirmed at necropsy.

tion. With certain complications of dissecting aneurysm the electrocardiogram may be altered. These include shock from hemorrhage, bleeding into the pericardium with tamponade, and dissection along one or both coronary arteries.

Sufficient loss of blood will produce subendocardial ischemia, the changes of which have

FIG. 11



Diffuse T-wave inversion due to pericarditis in subacute phase in a white woman, 41 years old, convalescing from acute rheumatic fever. In the subacute phase it is seldom possible to differentiate ischemia from pericarditis by the EKG.

been described. Bleeding into the pericardium may be associated with pericarditis and generalized ST elevation of minor degree or T inversion. Dissection along a coronary artery may produce myocardial infarction if the vessel's lumen becomes occluded. In a recent case at our hospital the dissection proceeded down the base of the aorta to involve an adjacent portion of right atrial wall, and atrial injury was apparent in the electrocardiogram (Fig. 12, A and B).

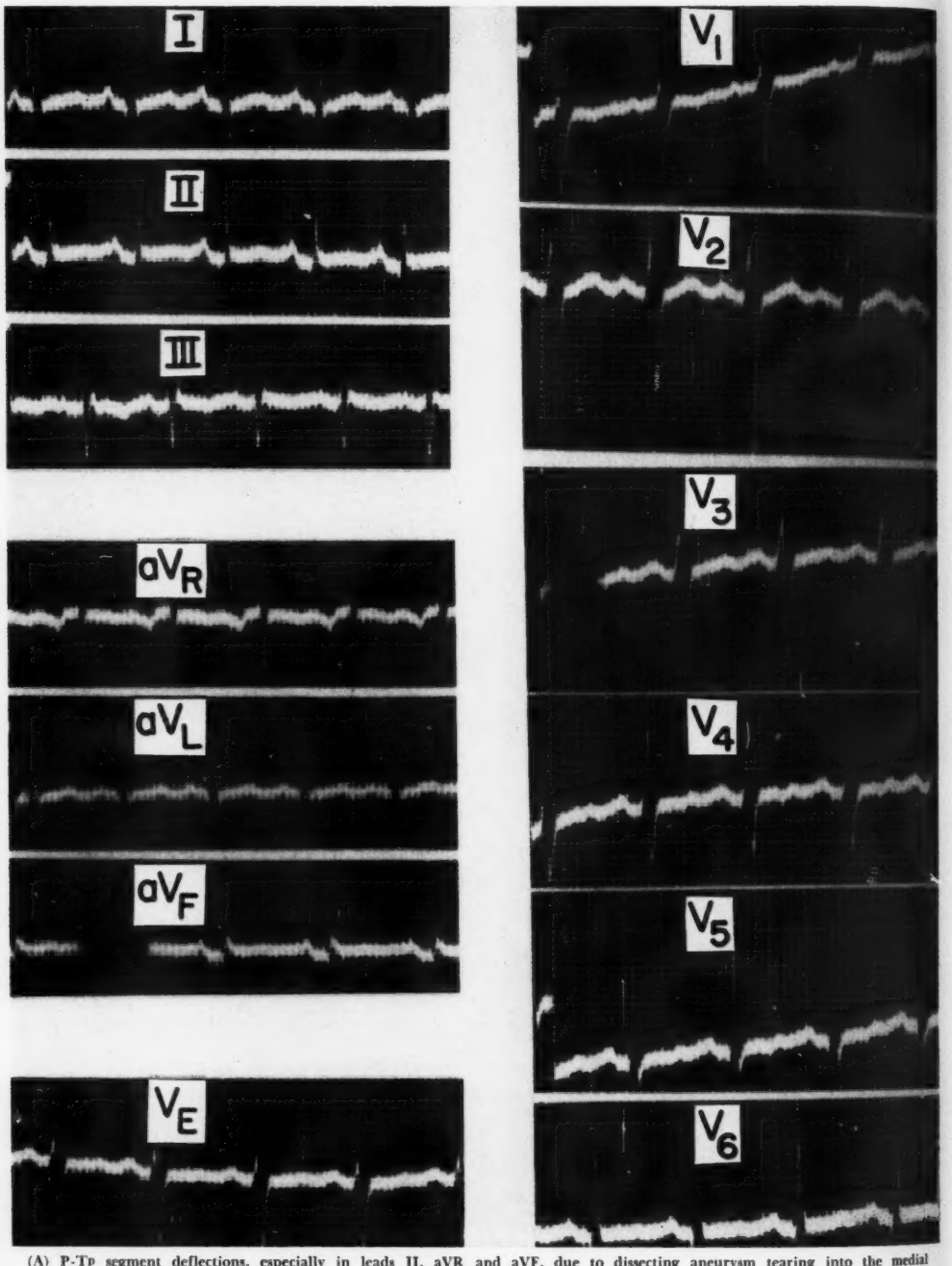
Spontaneous Pneumothorax

Again the chief value of the electrocardiogram is that it usually remains unchanged. In tension pneumothorax right ventricular filling becomes impaired, in which case the changes of subendocardial ischemia may occur.

Miscellaneous

Other causes of acute thoracic pain in which the electrocardiogram is of help as a negative

FIG. 12, A



(A) P-TP segment deflections, especially in leads II, aVR and aVF, due to dissecting aneurysm tearing into the medial wall of the right atrium of a hypertensive white man aged 46 years.

finding are herpes zoster, pleurodynia, rib fracture, esophageal spasm and acute tracheobronchitis. It is well to keep in mind that in any infection, however, a minor degree of

FIG. 12, B

(B) Photograph of the right atrium opened at necropsy; arrows indicate ecchymotic areas in the endocardium underlying dissection in the atrial wall.

myocarditis may occur and this may lower or transiently invert the T-waves. Secondary changes in the electrocardiogram have also been described in association with upper gastrointestinal spasm, presumably mediated by the parasympathetic nervous system; these uncommon changes again are usually minor and nonspecific.

Comment

In this review discussion was limited to electrocardiographic features of diseases that may cause acute pain in the chest. In some of these diseases other laboratory examinations are more important than electrocardiography, and in all of them a good clinical examination is the most valuable of all. By knowing what may be expected of the electrocardiograph, however, one may obtain the utmost value of that instrument.

Summary

The pertinent positive and negative electrocardiographic findings that occur in certain diseases that cause acute chest pain have been described. The diseases considered include angina pectoris, myocardial infarction, pulmonary embolism, pericarditis, dissecting aneurysm and spontaneous pneumothorax.

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Discussion (Abstract)

Dr. Ralph M. Denham, Louisville, Ky. We are indebted to Dr. James for this thorough discussion which places the electrocardiogram in its proper role in the evaluation of chest pain. There is little for a discussant to do but compliment the author on this interesting presentation.

The importance of obtaining the electrocardiogram during an episode of pain is worth emphasizing. All authorities on the electrocardiographic findings during spontaneous angina pectoris would not agree that these changes would always be abnormal.

In selecting the optimal time for obtaining the electrocardiogram in patients having chest pain other factors than those mentioned should be considered. Other external and emotional stimuli are important. I am reminded of a man who had typical angina with a normal resting electrocardiogram. He was highly emotional and had frequent spontaneous bouts of pain while hospitalized. The resident staff kept the electrocardiograph on a stand-by basis hoping to record such an episode. They had no success and obtained several normal electrocardiograms. However, when a beautiful blonde technician applied the electrode jelly to the chest, pain was immediately forthcoming and the electrocardiogram was abnormal.

If on the exercise electrocardiogram there is elevation of the ST-segments rather than the usual depression this too may be of prognostic significance. On two occasions observed by us, myocardial infarctions, one of which was fatal, occurred shortly after this finding was observed.

The use of supplementary leads V_7 and V_8 has not been of too much help to us in finding otherwise obscure posterior infarctions. The careful scrutiny of the usual chest leads for increased voltage of the T-waves has been of help as an early change in posterior infarction. The high V-leads have frequently been of help in evaluation of chest pain in which there was suggestion of high lateral wall infarction in lead aVL.

As has been mentioned the electrocardiogram may be misleading in the evaluation of chest pain. The patient with a history of previous infarction who has chest pain may present a problem if the previous electrocardiograms are not available. The persistent ST-segment elevation accompanying ventricular aneurysm cannot be differentiated from acute infarction on the basis of a single electrocardiogram. Serial electrocardiograms along with clinical data usually will clarify this problem.

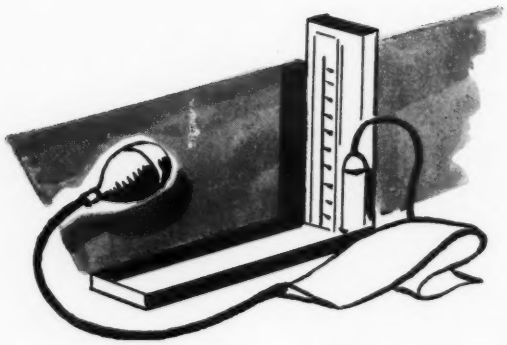
Chest pain accompanying paroxysmal supraventricular tachycardia may require some consideration as to whether it represents true coronary disease. The fact that ST-T abnormalities may follow bouts of tachycardia should be remembered. If one should encounter

ST depression and T-wave inversion in the patient with a history of chest pain, and one fails to recognize the pre-existing bout of tachycardia the erroneous assumption that these changes are due to coronary disease may be made.

The general problem of postoperative pulmonary embolism is more widely appreciated now than it was a few years ago. Hence, preoperative electrocardiograms are frequently obtained and are available for comparison if necessary during the postoperative period. This is helpful in the evaluation of postoperative chest pain which may be due to pulmonary embolism or myocardial infarction.

Even in retrospect I am not sure that I would have recognized the electrocardiographic evidence of auricular infarction as presented in the last case. The normal auricular T-wave is more pronounced with tachycardia than during normal rates and in this instance the heart rate was 110.

Lipman and Massie suggest that ideally the electrocardiographic record should be interpreted at the patient's bedside. The presentation which has just been given by Dr. James confirms the importance of correlating the electrocardiogram with other clinical data rather than making a flat-footed electrocardiographic diagnosis.



Atrial Septal Defects

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This form of congenital heart disease is one of the more common anomalies encountered in practice. Since it is curable by surgery, with a reasonable mortality rate, its correct and early diagnosis is important. The diagnostic criteria have been reviewed in this paper.

THE PURPOSE OF THIS PAPER is to present the characteristic clinical picture of atrial septal defects. Since the establishment of the Heart Clinic in the Medical College of South Carolina 10 years ago, 57 cases of interatrial septal defects have been diagnosed by a combination of cardiac catheterization, surgery, or autopsy. A review of the data obtained on these patients with particular reference to the electrocardiogram and the x-ray appearance will be made.

Incidence

Interatrial septal defect appears to be one of the most common forms of congenital heart disease. It was second in frequency in Wood's 200[1] and Nadas' 577 cases.[2] There was a lower incidence in an autopsy series due to the increased longevity of the patients as compared to most other forms of congenital heart disease. It was seventh in Abbott's[3] series of 1,000 autopsy cases.

The great majority of the previous studies have shown a higher incidence in the female.[4,5] Thirty-five of the 57 cases in this series were in females. The age distribution of our cases is illustrated in table 1.

TABLE 1

AGE DISTRIBUTION

Age	*Cases*
0-5	7
5-10	16
10-15	8
15-20	5
20-25	5
25-30	8
30-35	2
35-40	4
40-45	2

Types and Associated Defects

Defects in the atrial septum vary markedly in size, from the foramen ovale patent to a probe to complete or almost complete absence of the atrial septum in cor triloculare biventriculare. Functional closure of the foramen ovale occurs in 98% of individuals by 3 months of age.[6] However, a foramen ovale patent to probe persists in 20 to 30% of adults at autopsy.[7,8] These defects are usually of no clinical significance except for the rare exception of a paradoxical embolus.

The majority of atrial septal defects are 2 to 3 cm. in size. The ostium secundum defects may be located either high in the septum or in the region of the foramen ovale. Those ostium secundum defects high in the septum are complicated by partial anomalous venous drainage in a high percentage of cases. The ostium primum defects result from a failure of the septum primum and endocardial cushions to fuse and are located low in the septum. This type is commonly associated with deformities of the mitral or tricuspid valves with resulting insufficiency. An advanced form of the ostium primum lesion is a common atrioventricular canal. The majority of the atrial septal defects belong to the ostium secundum group.[9]

In this series, 53 of the 57 cases were thought to be of the ostium secundum type. There were 3 probable ostium primum defects; however, only one of these was definitely verified at operation. There was one case of atrioventricularis communis.

Atrial septal defects or patency of the foramen ovale are frequently associated with a variety of cyanotic heart lesions. The most

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common lesions are tricuspid atresia, Ebstein's disease, tetralogy of Fallot, and pulmonic stenosis.

The most commonly associated congenital cardiac anomaly in the non-cyanotic group is partial anomalous venous drainage into the right atrium. In our series associated cardiovascular anomalies were rather uncommon (see table 2).

Physiologic Changes

In the absence of an atrial septal defect the mean left atrial pressure is about 8 mm. of mercury, while the right atrial pressure is 4 to 5 mm. of mercury. With a small atrial septal defect this pressure gradient tends to be maintained. This results in a left to right shunt with a large pulmonary blood flow as compared to the systemic. However, when an atrial septal defect becomes greater than 2 square centimeters in size, no significant pressure gradient persists.[10] In spite of this the left to right shunt continues in the presence of a large defect. This has been explained by the demonstration that the right ventricle has a greater distensibility than the left ventricle when presented with an equal filling pressure.[11] There occurs a marked increase in the right ventricular output of 7 to 20 liters in the presence of a significant septal defect, instead of a normal of 4 to 5 liters. The left ventricular output remains the same or is slightly decreased. The increased right ventricular output over a period of many years eventually leads to right ventricular failure. Pulmonary hypertension may occur in these cases as a result of increased pulmonary blood flow or increased arteriolar resistance. Significant pulmonary hypertension due to increased arteriolar resistance is not usually encountered until the third decade and may not be present until even much later.

Symptoms and Physical Signs

There is a rather wide variation in the symptomatology depending largely on the type and size of the septal defect. The majority of patients with ostium secundum defects have no disabling symptoms until the third or fourth decade.[5] However those with ostium primum defects frequently have difficulty in childhood or infancy.[12] The symptoms presented by the infant group usually consist of frequent upper respiratory infections, failure to gain weight, and difficulty in feeding. Exertional dyspnea, fatigue, palpitation, chest pain and episodes of right-sided failure are the more common symptoms in the older children and adults. Cyanosis does not usually appear until quite late in the course of the simple ostium secundum defects. However, it is observed quite frequently with the ostium primum defects at a much earlier age. The cyanosis is a result of reversal of the left to right shunt because of right ventricular failure and/or pulmonary hypertension.

TABLE 2

ASSOCIATED CARDIOVASCULAR ANOMALIES IN 57 CASES OF ATRIAL SEPTAL DEFECT

Coarctation of the aorta	1
Pulmonic stenosis	
Autopsy case	1
Suspected from findings at cardiac catheterization	3

On physical examination the patient frequently appears somewhat asthenic. The examination of the jugular vein is usually not very helpful; however, tall V-waves preceded by a systolic collapse may be noted. Inspection and palpation of the precordium may elicit a number of things of considerable value. The finding of a deformity of the left chest with a right ventricular heave or lift is usually indicative of a marked right ventricular hypertrophy. However, these findings do not usually occur until later in the course of the uncomplicated ostium secundum defects. Deformities of the left chest frequently occur at an early age in ostium primum cases. According to Blount[13] a thrill is only rarely palpated over the pulmonic area. Thrills are more commonly palpated in the ostium primum defects, but are usually maximal in intensity one to two interspaces below the pulmonic area in this case.

On auscultation, the ostium secundum defects present a blowing systolic murmur high along the left sternal border, maximal at the pulmonic area. It is usually of a Grade 2 to 3 intensity on a 6 grade basis. The second heart sound is characteristically accentuated and widely split. The murmurs of the ostium primum defects are located lower along the left sternal border and are harsher in intensity. They are transmitted to the apex and frequently into the axillae. The murmur of the ostium secundum defect is thought to

be secondary to increased blood flow through the pulmonic valve. The ostium primum murmur probably arises from the regurgitant flow through the mitral valve and the low lying defect.[2] In the presence of marked pulmonary hypertension a pulmonic insufficiency murmur is frequently audible.[14]

In the past the presence of an apical diastolic rumble was thought to indicate the presence of an associated mitral stenosis or Lutembacher's syndrome. However, it is now thought that the great majority of these murmurs represent functional tricuspid stenosis, and Lutembacher's syndrome has proved to be a rare finding. This murmur was observed in 29 of Blount's 52 cases[13] and 50 of Campbell's 100 cases.[5] However, in our series of 57 cases it was detected in 8, and was presumed to be on a functional basis in all.

Clubbing has been a rather uncommon feature in most series.

Electrocardiogram

The electrocardiogram is frequently quite helpful in the diagnosis of these cases. The RSR′ complex or diastolic overload type pattern in the first precordial lead is present in the majority of the ostium secundum and primum defects. It is thought by most authors to be a result of hypertrophy of the right ventricular outflow tract.[15,16] Nadas[2] states that this pattern occurs in all cases of atrial septal defects. However, most other series give a somewhat lower incidence. Walker and associates[17] had a 63% incidence in 95 cases proven by cardiac catheterization. Downing and Goldberg[4] had one of the lowest incidences with 27% in 91 verified cases. A normal or right axis is seen in the ostium secundum cases. The ostium primum lesions are characterized by a high incidence of prolongation of the P-R interval and left axis deviation. Friedberg[18] states that the atrial septal defect is the only congenital cardiac anomaly which is frequently associated with atrial fibrillation or paroxysmal auricular tachycardia. Atrial fibrillation does not usually occur until late in the course of the disease. The findings in our series are shown in table 3.

TABLE 3

ELECTROCARDIOGRAPHIC FINDINGS IN 54 CASES OF ATRIAL SEPTAL DEFECT

1. RSR′ or diastolic overload pattern	30
2. Right ventricular hypertrophy	12
3. Biventricular hypertrophy	1
4. Normal tracings	10
5. Right axis	42
6. Normal axis	5
7. Left axis	5
8. Atrial fibrillation	1

Roentgenologic Findings

The roentgenologic findings in atrial septal defects with a significant shunt are usually quite characteristic. Cardiomegaly is present in the majority of cases with right auricular and right ventricular enlargement. An ostium primum defect should be suspected in any case presenting significant left ventricular enlargement. Left auricular enlargement is seen only late in the course of these defects after a right to left shunt has occurred. The increase in pulmonary vascularity is frequently quite striking and is accompanied by large branches of the main pulmonary artery. A hilus dance is present on fluoroscopy in a high percentage of cases. The aortic knob is small in the majority of cases. The findings in 50 of the 57 cases of this series are shown in table 4.

TABLE 4

ROENTGENOLOGIC FINDINGS IN 50 CASES OF ATRIAL SEPTAL DEFECT

Heart Size						
CT Ratio 50% or more		40				
CT Ratio less than 50%		10				
Chamber Enlargement			*RA*	*RV*	*LA*	*LV*
Normal Size			2	2	47	38
Enlarged	1+		15	10	3	11
	2+		21	19		
	3+		11	16		
	4+		1	3		
Pulmonary Vascularity						
Normal			3			
Increased	1+		12			
	2+		16			
	3+		15			
	4+		4			
Main Pulmonary Artery						
Normal			3			
Enlarged	1+		7			
	2+		13			
	3+		18			
	4+		9			
Hilus Dance						
Yes			29			
No			5			
Not mentioned			16			
Aorta						
Normal			13			
Small			36			
Enlarged			1	(also had coarctation)		

Laboratory Diagnosis

Cardiac catheterization is essential for establishing the diagnosis. An increase in the oxygen saturation of two volumes per cent from the superior vena cava to the right auricle is considered significant.

The dye dilution technics are quite helpful in determining the presence and the magnitude of the interatrial shunts.

Angiocardiography may be of some aid in the diagnosis of these defects. It may reveal early opacification of the left atrium and reopacification of the right atrium. It is most helpful in those infants who have a patent foramen ovale or atrial septal defect complicating an Ebstein's disease, tricuspid atresia, or pulmonary stenosis.

Courses and Prognosis

The course and prognosis of individuals with interatrial septal defects vary considerably. In a recent review Campbell and associates[5] attempted to determine the course of atrial septal defects from a review of 100 cases. Infants with large defects tended to improve somewhat after the first 2 years. After infancy the majority of the patients led relatively normal lives for the next two decades. Even at 30 years of age about 85% were still doing well. By the fourth and fifth decades the majority were severely disabled. Congestive heart failure and pulmonary infarctions were the most common causes of death. The average age of death was 40 years in Nadas' series,[2] 36 years in Roesler's,[19] and 37 years in Burnett and White's.[20] However, there have been reports of patients living to the age of 70 or 80 years.

Treatment

Atrial septal defects can now be cured surgically. Although a low mortality rate is essential the method of choice must also be definitive. Whereas the closed methods may have a low mortality, there is a substantial prevalence of residual shunts which will require a subsequent operation with a much higher mortality. Furthermore, the closed method does not lend itself well to correction of the unexpected defect such as anomolous venous drainage or ostium primum. For these reasons cardiopulmonary by-pass with the pump oxygenator is the method of choice for repair of all atrial septal defects. The mortality should be less than 5% in proper hands (ostium secundum defects).

Summary

The characteristic features of atrial septal defects have been presented. The findings in 57 cases were described with particular reference to the electrocardiographic and x-ray picture. In the majority of cases a presumptive diagnosis can be made with the correlation of the clinical, x-ray, and electrocardiographic findings. However, a definite diagnosis depends on the findings on cardiac catheterization. The treatment of choice of all atrial septal defects is surgical closure using the cardiopulmonary by-pass with the pump oxygenator.

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A Relationship Between Initial Therapy in Pulmonary Tuberculosis and Treatment Failures

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It seems quite clear that the end results of antimicrobial therapy in pulmonary tuberculosis are in a large measure dependent upon adequate therapy in the initial stages of the disease.

THE PURPOSE OF THIS STUDY on medical and surgical tuberculous patients is to evaluate the results of initial treatment with the more commonly known antimicrobial agents when used in conventional doses. The prevalent doses of drugs used on these patients were as follows: streptomycin 1 Gm. twice a week, INH (isoniazid) 100 mg. three times a day, PAS (p-Aminosalicylic acid) 6 to 10 Gm. daily in divided doses; the most common combinations were streptomycin twice a week with isoniazid daily or isoniazid daily with PAS. Several reports have shown that certain combinations can produce inferior therapeutic results, for example, streptomycin bi-weekly combined with INH or PAS being less effective than other combinations, particularly those including streptomycin daily.[1,2]

The period for study was selected at random but with a view to providing a follow-up of at least 2 to 3 years in all patients. It also coincides with the publication of results from the first comprehensive therapeutic trials in tuberculosis carried out by the British Medical Research Council.

The following review covers 196 tuberculous patients treated by medical and surgical methods and discharged from this institution between June, 1955, and June, 1956. Many of these patients had had treatment elsewhere prior to admission here. Three hundred and sixty-four case histories of the above year were actually examined. One hundred and forty-eight were excluded as irregular discharges, nontuberculous problems, etc. The discharge rate against medical advice was approximately 28%; however, the patients who had an irregular discharge but had had more than 7 months chemotherapy here, have been included in this study. Twenty patients could not be traced and have been eliminated from the study. The remaining 196 have been followed up to the present time and are analyzed in this paper.

Studies of drug susceptibility were not available on these patients, but the serious significance of a persistently positive sputum after long periods of chemotherapy will be stressed.

The group studied is divided into 68 patients treated medically alone and 128 patients who required some form of thoracic surgery.

As is seen in table 1, 41 of the medical group were classified far advanced cases of pulmonary tuberculosis, 26 as moderately advanced, and one as minimal. The length of stay in this hospital varied from 7 to 29 months. Sixteen patients (23%) had further reactivation of disease requiring hospitalization since their discharge; a number of these recovered after further therapy. There were 13 deaths in this group, 9 of them being from pulmonary tuberculosis. Forty-three patients (63%) were well on review. Fifty-four patients initially had sputum positive for tuberculosis on admission here. Twenty-one patients were still positive on discharge or transfer or death (Table 2). Thus, 38% had failed to convert the sputum in spite of prolonged chemotherapy. Fifty-seven out of the 68 patients in this group were treated almost entirely with bi-weekly streptomycin and daily isoniazid or PAS.

Of the 128 surgical patients, 86 were classi-

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TABLE 1

ANALYSIS OF MEDICAL CASES

Classification	Number of Cases	Hospital Stay (Months)	Mortality		Relapse	Well on Review
			TB	Other		
Far Advanced	41					
Moderately Advanced	26	7-29	9	4	16 (25%)	43 (63%)*
Minimal	1					
Total	68					

*This includes some cases also in the "relapse" column who recovered following further treatment.

fied as far advanced, 31 as moderately advanced and one as a minimal case of pulmonary tuberculosis. The length of stay in this hospital varied from 3 to 29 months. The various types of operations performed are outlined in table 3. The term monosegmental is used here to imply resection of one segment or one wedge. Multiple resection is used comprehensively to include the resection of more than one segment, more than one wedge, more than one lobe, or a combination of either of these. The more frequent operations were lobectomy (34) and multiple resection (39). The sputum was initially positive on admission in 77 of these cases; it was still positive on transfer or discharge or death in 21 cases (27%). Reactivation of disease subsequently occurred in 19 patients. There were 10 postoperative deaths; one patient committed suicide after a postoperative psychotic reaction, and one died 4 months after operation, following a massive tuberculous spread postoperatively. The postoperative complication rate was 16%, that is, those cases requiring further surgical treatment. One of the patients developed a postoperative schizophrenic reaction, but the most common type of complication encountered was that of bronchopleural fistula (Table 3), as with similar experiences reported by other authors. One hundred and one patients are well on review (79%) though a few have had positive sputum intermittently and therefore are also included under failure to convert. The indications for operation were persistent cavitation in 57 cases, bronchiectasis, destroyed lung or fibrocaseous disease, etc. in 45 cases. Resected specimens were reported as showing "active disease" from 68 patients, and "inactive or quiescent disease" from thirty. The treatment in 114 of this group consisted almost entirely of biweekly streptomycin and daily INH.

In a substantial number of cases a positive sputum persisted in spite of many months of combined chemotherapy and surgical treatment in some of the cases. The probable reason for this is inadequate therapy given initially. Success in the medical group would depend on the patient's cooperation to some extent. However, as long as the patient is taking the drugs prescribed, we feel it depends mainly on susceptibility of the bacilli to these drugs and the adequacy of the chemotherapy reaching the bacilli. In the surgical group it would depend on various factors such as the surgery technic, anesthesia, length of operation time, postoperative care, etc.; but here again much depends on whether the chemotherapy given initially has been adequate, and whether or not the bacilli had developed a drug resistance prior to the patient's coming to operation.

In the medical group, of 25 cases of relapse and tuberculous deaths, the treatment consisted almost entirely of streptomycin biweekly and INH daily or PAS in 22. This

TABLE 2

BACTERIOLOGIC STATUS (ALL CASES)

	Admission Sputum		Final Sputum State		Failure to Convert	Number of Cases
	POS.	NEG.	POS.	NEG.	Per Cent	
MEDICAL	54	14	21	47	38%	68
SURGICAL	77	51	21	107	27%	128
	131	65	42	154	32%	196

TABLE 3

ANALYSIS OF SURGICAL CASES

Type of Surgery	Disease Classification				Postoperative Complications			Mortality			Well on Review
	FA.	MA.	MIN.	Total	B-P Fistula Empyema	Spread or Reactivation	Others	Reactivation After Discharge	Postoperative	Other	
Thoracoplasty	9	3	—	12							
Lobectomy	24	10	—	34							
Monosegmental resection	3	14	1	18	15	2	3	19	10	3	101* (79%)
Multiple resection	25	14	—	39							
Pneumonectomy	23	—	—	23							
Paulino procedure	2	—	—	2							
Total	86	41	1	128							

*Includes some cases from the "postoperative complications" and "reactivation" columns who recovered following further treatment.

same treatment was given to 34 of the 48 patients who had reactivation of disease, postoperative complications and deaths in the surgical group. The patients treated with PAS daily and isoniazid daily as initial treatment did not provide a number large enough to warrant any satisfactory conclusions. However, from these data it seems fair to assume that these combinations of drugs have been inadequate as initial treatment for a substantial percentage of these patients. This would confirm the findings of the British Medical Research Council and others in this country and elsewhere. Kass and others[2] have analyzed case material with regard to the conversion of sputum after 5 to 8 months of therapy; the Veteran's Administration group with INH and PAS daily had a sputum conversion of 85%; with intermittent streptomycin and INH daily, 68%; and with intermittent streptomycin and daily PAS, 58%; the corresponding figure in the authors' hands being a 100% conversion rate using a high streptomycin, high isoniazid combination.

A great deal is being written about modern chemotherapy of pulmonary tuberculosis. It has been demonstrated that the use of streptomycin bi-weekly with isoniazid daily or PAS daily results in a higher incidence of drug resistance[1,3] and cannot be recommended as initial treatment. Indeed PAS with isoniazid, both used daily, has been shown to be superior to such a combination in the trials referred to in the opening paragraphs. Many authorities today are in favor of streptomycin daily and isoniazid daily in adequate dosages as initial treatment in pulmonary tuberculosis. High dosage of INH is gaining in favor in an effort to obtain adequate levels of serum isoniazid for most patients. In this respect remarkable success has been reported from the National Jewish Hospital at Denver and a few other centers. Reports from that hospital show a sputum conversion rate in over 99% of cases initially treated at that hospital. The sputa of these patients were all positive for typical *Mycobacterium tuberculosis* on admission and the bacilli were susceptible to isoniazid, streptomycin and PAS. The most effective combination found by that hospital is the use of a combination of high dosages of streptomycin and isoniazid.[2,4] PAS is used to raise the level of microbiologically active serum isoniazid in cases in which there is rapid inactivation of this drug. Pyridoxine is given with high INH dosage to protect against neuropathy. In the past year we have used a high INH—daily streptomycin regimen in all newly diagnosed cases of far advanced tuberculosis. Our sputum conversion rate has also been 100 per cent.

Berte and associates[5] have described the combination of PAS daily with high dosage of isoniazid as providing superior results in all phases of the clinical evaluation when compared with a regimen of low dosage of isoniazid and PAS. The same authors note that adding streptomycin daily to a high dosage isoniazid-PAS regimen produced a greater percentage of closure of cavities, though there was no apparent difference in the bacteriologic results. However, comparing these results with those using streptomycin intermittently and with a low dosage regimen of INH-PAS, they suggest there are definite indications for the substitution of streptomycin

daily and a high dosage of isoniazid in such combinations. Rothstein[6] mentions two reports presented at the 17th Veterans Administration Armed Forces Conference on the "Chemotherapy of Tuberculosis." These reports indicate that larger doses of INH with PAS (and pyridoxine) or high dosage of isoniazid with streptomycin daily (with or without PAS) may be more effective than the more commonly used doses.

There is thus an indisputable relationship between the choice of initial therapy and failure to respond to treatment in pulmonary tuberculosis. There is, moreover, no longer the need to withhold a major drug for future developments as there are today a sufficient number of drugs available should these be needed. Furthermore, to obtain maximum radiologic improvement and a negative status of sputum is the best possible preparation for surgery. A positive sputum is not always a deterrent to operation provided, however, there is adequate and appropriate coverage with chemotherapy. Today we have the choice of weapons whereby success can be achieved in nearly 100% of newly diagnosed cases. This would also eliminate the very serious problem of drug-resistant cases that are now being seen so frequently. There can be no doubt that many of these instances are caused by an inadequate therapy used in the *initial* period. As others have stated before, we believe that intensive and appropriate drug therapy given at the beginning of treatment, together with adequate bacteriologic control, is the key to satisfactory results in tuberculosis management.

Summary

1. A study of 196 patients is presented. The treatment consisted of combinations of streptomycin, isoniazid and PAS in conventional dosages. Usually it consisted of streptomycin bi-weekly with INH or PAS. The follow-up was 2 to 3 years in all cases.

2. Of these patients, 128 had some form of thoracic surgery. The sputum failed to convert in 27 per cent. The rate of postoperative complications was 16%, most commonly bronchopleural fistulas; the postoperative mortality was 7 per cent. One hundred and one patients were well on review.

3. Among those treated medically only, there was a reactivation rate of 23%; some of these recovered after further treatment. The sputum failed to convert in 21 patients. Sixty-three per cent were well on review.

4. The over-all failure of 32% to convert the sputum is attributed most commonly to the fact that initial therapy in these patients was probably inadequate. The present position with regard to high dosage chemotherapy, particularly a high dosage of streptomycin—high INH combination, is discussed.

Acknowledgments

We are grateful to numerous medical practitioners who readily supplied information requested.

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CASE REPORT

Cryptococcosis (Torulosis) of the Central Nervous System Treated with Amphotericin B During Pregnancy

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It is too early to predict the ultimate prognosis in this case and thus the efficacy of treatment. However, the case report is published since it presumably is the first reported instance of the use of amphotericin B during the course of pregnancy. This is of interest because of the azotemia which may accompany the use of this antibiotic, though whether from nephrotoxicity or from a biologic competition with nitrogenous substances is not settled.

TORULOSIS OF THE CENTRAL NERVOUS SYSTEM has been a known clinical entity in the United States only since 1916, when Stoddard and Cutler described 2 cases that presented as brain tumors. Eleven years earlier, Hansemann, in Germany, had isolated fungi from the spinal fluid of a patient thought to have tuberculous meningitis.[1] The disease has been recognized with increasing frequency in the last 20 years but the total number of cases reported in the American literature is below 400.[2]

About 10% of the cases of cryptococcosis have only pulmonary, or primarily pulmonary involvement. The remainder have primarily disease of the central nervous system.[2] The protean clinical manifestations are described in the various case reports, particularly in articles by Gendel, Ende, and Norman[3] and Nichols and Martin.[4] Torular meningitis should enter into the differential diagnosis of any case of meningitis or encephalitis. One report describing 4 cases of torular meningitis states that only one case of tuberculous meningitis was seen during the same period.[10]

Various drugs have been used in the treatment of cryptococcic meningitis, including: cycloheximide,[6] 2-hydroxystilbamidine,[2] nystatin,[2] and the several chemotherapeutic and antibiotic agents.[7] Results have been disappointing. Of the published cases 80 to 90% have succumbed within a year. The longest known survival, reported by Beeson,[8] was a patient who lived 16 years after the diagnosis was established. Recently, there have been several case reports advocating the use of amphotericin B (Fungizone) by the intravenous route. This agent is produced by an unknown species of Streptomyces.

Encouraging reports have come from some authors,[4,5,10,11,12] but others have had poor results.[2,9,13] There is, to my knowledge, no information concerning the effect of this agent on pregnancy. Neither is there information about the placental transfer of the disease. Neuhauser and Tucker[14] reported 3 cases of diffuse cryptococcosis in newborns but the mothers were well. Gantz[13] reported a case of torula meningitis diagnosed in a woman one month after she had delivered a normal child. This woman succumbed despite sterilization of her spinal fluid with amphotericin B.

The following case report describes a woman who was treated for 5 months of a normal pregnancy and delivered a normal child:

A. C., a 19 year old pregnant woman was admitted to the 2789th USAF hospital on Sept. 9, 1958, with a diagnosis of Torula meningitis.*

Her illness dated to March, 1958, when she became pregnant and developed nausea, vomiting and headache. The symptoms became increasingly severe, and

*The author wishes to thank Dr. Robert Mudd who initiated treatment at the Mobile Infirmary, and later transferred the patient to the 2789th USAF Hospital.

in July the family noticed that her eyes were "crossed" and she had a staggering gait. On July 25 she was admitted to a civilian hospital and was found to have ataxia, palsy of the 6th nerve on the left, and bilateral papilledema. The deep tendon reflexes were depressed and there were bilateral Babinski signs. She was thought to have a posterior fossa tumor. Spinal puncture released 2 cc. of cloudy fluid which contained 150 cells per cu. mm. of which only 20 were polymorphonuclear. The protein was 86 mg. and the sugar 36 mg. per 100 cc. Cultures were negative for pyogens and for acid-fast bacilli, but *Cryptococcus neoformans* was demonstrated on india ink preparation and was recovered from cultures. (Table 1 shows the serial spinal fluid findings at that period of hospitalization.)

When she was admitted to that hospital the patient was thought to be 4 months pregnant. She had a Hgb. of 9.6 Gm. with a normal WBC count and differential picture. The urine was essentially normal. Blood chemical studies including BUN., sugar and electrolytes were normal. Skull films and a chest x-ray film were also normal.

On July 28 a spinal catheter was inserted for continuous drainage and the patient was started on amphotericin B. A daily intravenous dose of 25 mg. was given over a 6 hour period in 5% dextrose and water. She was also given tetracycline by mouth and later by injection. Because of severe vomiting various antiemetics were employed. On Aug. 13 the spinal catheter was removed and amphotericin B was discontinued. Papilledema was noticed to be less pronounced. Two days later treatment was resumed using 50 mg. daily. On Sept. 2, tetracycline was discontinued after 5 weeks of use. On Sept. 9 she was transferred to the 2789th USAF hospital after 6 weeks of amphotericin therapy.

On admission she felt well but was disoriented as to time. Neurologic abnormalities were limited to general tremulousness and bilateral papilledema, somewhat more marked on the left. She had a Hgb. of 7 Gm. and a WBC count of 10,000 with 85% polymorphonuclear cells. There was present a mild proteinuria but the BUN. was normal. Spinal puncture released clear fluid under elevated pressure. No cells or organisms were found. The protein was 61 and the sugar 44 mg. per 100 cc. (Table 1 shows the findings serially on this admission.)

The patient was started on iron parenterally. On Sept. 12 she received 75 mg. of amphotericin B and had a shaking chill followed by emesis. She became stuporous but no lateralizing signs appeared. A liter of whole blood was administered and she improved markedly. During the next 2 weeks she had morning nausea and vomiting. The optic discs varied in appearance but were never flat. On Sept. 25 she began to have hallucinations. She was given another 1,000 cc. of blood, and daily infusions with 25 mg. of amphotericin B were resumed. She promptly improved and 4 days later was fully oriented and had no papilledema. Treatment was changed to 50 mg. of the fungicide on alternate days. Her vomiting ceased and she began to gain weight for the first time during her pregnancy. On Oct. 17 she received her last infusion. Her second course of treatment had been 3 weeks in length using an average daily dose of 25 mg. She continued to have occasional headaches and abnormal spinal fluid. On Nov. 8 she had a grand mal seizure. Dilantin and phenobarbital were started. She remained fairly well and on Dec. 23 delivered a normal 6 pound male infant. On Jan. 5, 1959, she was discharged from the hospital.

In mid-January, 1959, she had another grand mal seizure and was seen at the Pensacola Naval Hospital. An EEG. showed a diffuse dysrrhythmia and she was again started on anticonvulsants. She had frequent headache and vomiting during the remainder of Jan-

TABLE 1

SPINAL FLUID FINDINGS

	Opening Pressure In MM H_2O	*Protein In Mg.%*	*Sugar In Mg. %*	*Mononuclear Cells*	*Polymorphonuclear Cells*	*Serology*	*India Ink Prep.*	*Culture (Fungus)*	*Miscellaneous*	*Amphotericin B*
	Spinal Fluid Findings During Admission to Local Civilian Hospital									
July 28	55	86	36	130	20	—	POS	POS	Pyogenic and AFB	
	—	—	—	200	30	—	POS	POS	cultures—negative	
Aug. 6	—	—	—	—	—	—	POS	POS		
Aug. 12	—	—	—	—	—	—	POS	POS		
Aug. 13	—	—	—	6	1	—	—	—		
	Spinal Fluid Findings During First Admission to 2789th USAF Hospital									
Sept. 9	330	61	44	0	0	0	0	0		
Sept. 12	80	—	—	0	0	—	0	0	Hypotensive	
Sept. 25	220	103	40	0	0	0	0	0	1110000000 Gold sol	
Oct. 9	215	113	38	0	0	—	0	0		
Oct. 21	270	125	36	0	0	—	0	0		
Oct. 31	245	125	—	0	0	—	0	0		
Nov. 19	195	102	36	0	0	—	0	0		
Dec. 17	—	124	—	12	3	—	0	0		
	Spinal Fluid Findings During Second Admission to 2789th USAF Hospital									
Feb. 11	140	197	41	64	0	—	0	0		
Mar. 3	150	195	—	2	0	—	0	0		
Mar. 11	170	175	—	20	0	—	0	0		

uary and was finally readmitted to our hospital on Feb. 10. She had no abnormal neurologic findings but spinal puncture revealed an elevated opening pressure and there were 64 mononuclears per cu. mm. The protein was 195 mg. per 100 cc. (Table 1 shows the serial spinal fluid findings.)

She was again treated with amphotericin B, approximately 50 mg. 3 times a week. Anticonvulsants were continued. The patient improved from a clinical standpoint and there was slight improvement in the spinal fluid findings. No organisms could be demonstrated. On March 12, 1959, she was discharged at her own insistence.

Summary and Conclusions

Cryptococcosis of the central nervous system has been fatal in 90% of the reported cases. Various drugs have been used in treatment, none with great success. In the last two years amphotericin B has been reported by several authors to have a favorable influence on the progress of torulosis.[9-13] We have recently treated a patient with this drug during pregnancy without apparent ill effects on the child. Our patient had a fairly good clinical remission despite a persistently elevated spinal fluid protein. In an illness which characteristically has an intermittent course it is difficult to evaluate therapy. However, there is a suggestion that amphotericin B may have a beneficial effect.

Brookley Air Force Base

Acknowledgment

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Social Origins of Delusions*

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The authors present an interesting analysis of delusions which should be kept in mind when considering such symptoms in the patient.

THE TRADITIONAL DEFINITION of a delusion, as given by Hinsie and Shatzky, is that it is *a false belief*, engendered without appropriate external stimulation and maintained in spite of what to normal beings constitutes plain-as-day proof to the contrary. Similarly, Fenichel[1] defines delusion as a "misjudgment of reality, based on projection." This is also how Kraepelin defined it, considering it the expression of a disorganized personality, and of no particular value. It was assumed that delusions were a hindrance to the patient. Nowadays, in psychoanalysis and psychotherapy, delusions are sometimes considered to represent resistance to the treatment. However, as early as 1908, Jung[2] compared delusions to dreams, and stated that delusions could be interpreted so as to be useful in treatment. About that same time, Freud carefully analyzed the delusions of Schreber, deriving considerable insight from the patient's delusional material. Years later, in 1938, Freud[3] made the somewhat startling comment that a delusion may have in it the distortion of an historically correct "kernel of truth."

In recent years, the psychoanalytic literature has referred to delusions as beliefs found in relatively sick patients, beliefs which are heavily invested with affect, impenetrable, and necessary for the splinting of a weakened ego structure.[2,3] Delusions are described as projections of the patient's illness onto the environment, an economic way for the patient to avoid recognition of the terrifying aspects of his crumbling reality by blaming others, or else as a form of fixed, wishful schizophrenic thinking. Delusions are thus seen as the extreme examples of pessimism or optimism, so rigidly held that the resulting sense of certainty reduces the patient's anxiety. In all of this, the emphasis has been that delusional content is specific to the sickness of the patient.

It is the purpose of this paper to emphasize the presence of a *"kernel of truth"* in delusional thinking, and especially to note that it arises out of the *current experiences* of the patient, and *can be utilized* in psychotherapeutic work with the patient.

We agree with Carl Jung's early notation, relating the content of delusions to the content of dreams. In both cases the manifest content is more or less unreal or fantastic, and the latent content must be sought more or less laboriously. Whatever the content is, it is specifically selected by the patient to express the peculiar character of his experience. We have recently been impressed by the additional concept that the content of a delusion is selective not only in what is projected, but also in terms of which particular part of the environment is the recipient of the projection. When a man has the delusion that his wife is promiscuous, for example, he has not only found an economical way to express his own promiscuous drives, but he also has identified his marriage as an etiologic factor in this disturbance. In fact, the delusion that his wife is promiscuous may indicate his correct perception of her feelings. At the same time, the wife is not driven into neurotic decompensation, because he is obviously "talking crazy," and her concern is treatment for his illness. When they finally arrive for psychiatric consultation, the husband's delusion presents prominently that he is sick and needs help with his sexual feelings. In addition, we have found repeatedly that the patient's disturbance arose directly from a reality situation, which the patient defined correctly in his delusional thinking. Hence, we offer a *modified definition* of a delusion as follows: A delusion *may* be a false belief,

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or it may be a correct belief; but in either case it is a fixed idea on the part of the patient for which he has no proof, from which he cannot be dissuaded by reason, which is precipitated by his current social situation in some direct way, and which constitutes a cry for help.

A case fragment illustrating this definition developed as follows: A young man and his wife, after several years of marital discord, were on the verge of divorce. At this point the man developed the fixed idea that his wife was unfaithful, although he was completely unable to find any proof for his delusion, and in fact could himself not understand how it was possible for her to leave the house and be unfaithful without his knowing it. Both persons were seen in psychotherapy, and it was found that the wife had indeed managed to establish a relationship with another man, and had become unfaithful to her husband at about the same time that he developed his delusion. In other words, the husband decompensated emotionally in the course of the marital stress, he developed a delusion regarding his wife which could not be shaken by evidence, he sought psychiatric help as a result of his decompensation, and he also had a kernel of factual truth in the particular delusion which he developed. His thinking was delusional, and at the same time it was factually correct. He had properly perceived the feelings of his wife, but had decompensated in his own functioning as a result of the marital stress. Furthermore, the husband experienced less panic after he developed his delusion. The distortion of his thinking was a part of the "wisdom of his body," which served to keep him sufficiently adjusted in society so that his decompensation did not progress to where he required hospitalization. His delusion was a projection of some of his own wishes to become promiscuous, which were completely unacceptable to him, so that he could acknowledge these wishes only in terms of another human being, in this case his wife. In the words of Masserman[4] his delusion was "the compensatory belief necessary to make his world seem a little more like the heaven he so ardently desired."

A second case fragment also illustrates the dual character of delusional thinking. As in the previous case, the delusion involved a personal decompensation, and at the same time a factually correct perception of the social situation from which it arose. A middle-aged woman was dying of carcinoma during a period of months. As she became more ill, her husband gradually lost his sexual interest in her. She developed the fixed idea that he was trying to kill her with poison, despite the fact that he continued to be most solicitous and was making every effort to prolong her life and make her situation as happy as possible. In her final weeks, her delusional insistence that he wanted to kill her was very troublesome. He sought psychiatric consultation because of his own anxiety in the situation. Nothing more was heard from him for about a year, at which time he returned for psychotherapy. In the first interview he confessed that during his wife's terminal illness he had begun going out with another woman, had fallen in love before his wife died, and had had repeated night dreams in which he murdered his wife. He had consciously wished that his wife would hurry up and die.

In this second case fragment it is again evident that the wife's delusion, that her husband wanted to kill her, represented both a psychiatric illness on her part, and a correct perception of her husband's feeling.

In summary, we wish to emphasize that delusional thinking arises not only from the life-long emotional disturbance of the patient who finally decompensates emotionally and intellectually, but is also largely determined by the current social situation of the delusional patient. The delusional distortion of thought processes is a way in which the patient asks for psychiatric treatment, and at the same time identifies the specific area of life which is most disturbing. The delusional content is specifically selected in terms of both, the patient's personality structure, and also the feelings and behavior of people near him. As with dreams, a given manifest content may point to various significant areas in the patient's experience. A careful interpretation and evaluation of delusional thinking is, therefore, a valuable procedure for the psychotherapist in helping his patient to find a more satisfactory personality integration.

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Discussion (Abstract)

Dr. Charles Watkins, New Orleans, La. Dr. Warkentin and his associates have done us a service by again pointing out a fact, generally known by the laity, but frequently forgotten by those of us who, because of our specialized interest and training, have become preoccupied with psychogenetics. There is little doubt that there is a grain of truth in the paranoid delusion and that this grain of truth is found in the current situation. With our need to help the patient understand the irrationality of his belief, we sometimes fail to accept that part of it which is true and lose the opportunity to work through the irrational part with the patient.

It seems strange that those of us who deal with psychotics and become so acutely aware of the sensitivity of the schizophrenic to the preconscious anxieties and tensions of the therapist should fail to see this fact. Nonetheless such is the case. I would suggest that one of the difficulties responsible for this lack of recognition is the therapist's reluctance to assess closely the ambivalence of the nonpatient. By that I mean the ambivalence of the environment including the psychotherapist. Many of us are unwilling to admit to the patient our own irritation toward them and our anger at their irrationality. Fortunately there are some therapists who are able to do this and the group presenting this paper is an excellent and unique example of that sort of therapist. Perhaps this is one of the reasons they have been able to discuss this very important problem, not only with their patients, I am certain, but also with us here today.

I find nothing to criticize in this paper. I think it is well done and presents a point that could be carried on to many hours of discussion. I am aware that the authors have much more material than they have presented. It is my hope that they will report further on this subject. The presentation, however, is certainly an introduction and one that I hope will stimulate others of us to give more thought to this very important subject.

A Study of a Protective Powder

HARRY M. ROBINSON, JR., M.D.,† *Baltimore, Md.*

The author gives his findings in the use of a powder which seems helpful in diaper rashes.

UNDECYLENIC ACID, a weak organic acid, possesses antipruritic and mild keratolytic action when applied to moist skin surfaces. Its action occurs when the salts, in contact with moist surfaces, are slowly hydrolyzed thereby releasing free undecylenic acid. Because of its bacteriostatic and fungistatic action, undecylenic acid and its salts have been incorporated in many commercially available products advocated for the treatment of superficial mycotic infections.

Under the direction of A. J. Vignec at the New York Foundling Hospital, a large scale clinical evaluation of a protective powder containing calcium undecylenate was initiated in 1953. He stated that the study was deliberately initiated during the summer months when the incidence of "diaper rash" is greatest. One hundred sixty-eight infants without eruptions were treated with daily applications of the prepared protective powder, and 114 infants without eruptions were treated with placebo powder. He stated that the development of eruptions in the group treated with the prepared protective powder occurred in 12.5% of the patients whereas in the control group 21% developed eruptions. He reported a good therapeutic result in the majority of infants with mild eruptions and in approximately 50% of the children with severe eruptions. No adverse reactions were noted.

This study was initiated to determine the efficacy of a powder containing calcium undecylenate in the prevention and treatment of "diaper rash" in infants.

The Study

The Powder. The preparation submitted for study was composed of the following ingredients:

	Per Cent By Weight
Calcium undecylenate	15.0
Talcum regular	41.0
Talcum 10 micron	40.75
Borax acid	3.0
Perfume	0.25

The mixture is a soft, white powder which is insoluble in water but which clings to moist surfaces. It has a light pleasant odor.

Patient Selection. One hundred forty-three infants, ranging in age from 2 weeks to 23 months, were selected at random from patients attending the well baby clinic of the University Hospital. Seventy-three of these children had no evidence of a skin eruption. Contact dermatitis of the diaper area was present in 26 patients, and intertrigenous eruptions, noncontact in origin, were present in 44 children.

Method of Treatment. Mothers were instructed to apply the powder lightly, without rubbing, to the diaper area each time the napkins were changed. The babies were bathed with a white floating soap and thoroughly rinsed. Diapers were washed in mild soap flakes and rinsed 3 times with warm clear water. Special baby oils, creams, and lotions were not used. Following bowel movements the children were cleansed with clear water, or mineral oil. The use of plastic or rubber pants was discouraged.

The routine used in this study for the treatment of the children with seborrheic dermatitis is the same usually used in the Dermatology Clinic for the treatment of other eczematous eruptions in children. In this study the protective powder was substituted for the corn starch powder normally used. Of

TABLE 1

RESULTS

Diagnosis	*Total Cases*	*Unchanged*	*Irritated*	*Improved*
Seborrheic dermatitis (Diaper rash) (Intertrigo)	70	8	2	60
No eruption	73	69	4	

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The materials used in this study were furnished by Dr. J. W. Crane of the Maltbie Laboratory Division of Wallace and Tiernan, Inc., Belleville, N. J.

the 70 patients with intertrigenous eruptions treated with the protective powder, 60 were definitely improved, 8 remained unchanged, and 2 developed evidence of local irritation. The adverse reaction subsided when the powder was discontinued. Sixty-nine of the patients with normal skin, who were treated with the powder, did not develop any eruption, and 4 of these patients had irritation (Table 1).

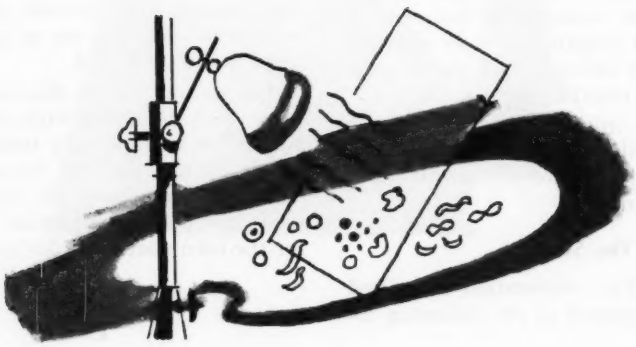
Comment

The evaluation of such a product is particularly difficult because accurate statistics are not available for the development of "diaper rash" in infants. It is also difficult to assess the difference in specific therapeutic virtues of placebo powders, corn starch, and the protective powder containing calcium undecylenate. Undoubtedly the institution of the regimen of cleanliness previously mentioned was a major factor in the production of such a high percentage of satisfactory results. The mild keratolytic action of undecylenic acid plus the moisture absorbing qualities of the powder are probably the factors responsible for the efficacy of this preparation in the treatment of seborrheic dermatitis in the diaper area. The powder has a pleasant odor, and is a pharmaceutically acceptable preparation. It is superior to corn starch and starch containing powders in absorptive properties. Because of its low sensitizing potential it is to be preferred to baby powders which contain antiseptics and other irritating substances.

Conclusions

1. The protective powder submitted for study is of value in the management of mild seborrheic dermatitis (diaper rash) in infants.

2. Because of its low sensitizing potential, the protective powder is superior to baby powders containing various antiseptics which have irritating properties.



CASE REPORT

Primary Carcinoma of the Liver with a Report of a Kupffer Cell Sarcoma*

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THE INCIDENCE OF PRIMARY CARCINOMA of the liver appeared to MacDonald,[1] of Boston, to be on the increase. This included an observation of four decades, from 1917 of 0.44% to the present decade of 0.72 per cent. An analysis of 16 reports of 131,476 autopsies, over a period from 1916 through 1957 revealed 390 cases with a percentage of 0.297.[1-16] The lowest incidence was reported in 1923 by Clawson and Cabot[3] of one per 5,000 autopsies or 0.02 per cent. The highest incidence was reported by Schupbach and Chappell of the Memphis Veterans Administration Hospital, of 14 instances among 797 autopsies or 1.76 per cent. We found 18 cases among 1,747 autopsies or 1.02% (Table 1).

This study is concerned with primary liver cell carcinoma (hepatomas), intrahepatic tumors with both liver cell and bile duct carcinomatous features (hepatocholangiomas) and one case of sarcoma.

Clinical Notes

The patients were from the New Orleans Veterans Administration Hospital, and were observed at autopsies from 1946 through 1957. They were all male patients with an average of 53 years with extremes of 23 and 65 years; 8 patients were negroes. The disease was insidious in onset and its course with few exceptions was rapidly downhill. The average onset of illness as ascertained by the patient was 4 months prior to admission with ranges of 2 weeks to 8 months. The chief complaints included upper abdominal pain, weakness, anorexia and weight loss. Eight patients had a history of chronic alcoholism. On admission, 40% has obvious jaundice and ascites and all but one had a palpable liver. Ten patients had liver biopsies with a Vim-Silverman needle; 8 biopsies were interpreted as liver carcinoma, one was read as cirrhosis, and one was diagnosed as carcinoma from an unknown site. The length of life after the onset of illness averages 5 months. Liver coma was the most common mode of exodus; 2 patients died from spontaneous rupture of a tumor nodule with massive peritoneal hemorrhage; 5 died from hemorrhage from ruptured esophageal varicosities, and one patient died from hemorrhage following a biopsy of a tumor mass.

TABLE 1

INCIDENCE OF HEPATOMAS IN U. S.

	Autopsies	*Hepatomas*	*Per Cent*
Analysis of 16 reports	131,476	390	0.297
Lowest percentage	5,100	1	0.020
Highest percentage	797	14	1.760
V.A.H., New Orleans	1,747	18	1.020

Pathology

The hepatomas in our series were similar to those reported in the literature. The tumors varied from the small nodular type, composed of centimeter sized nodules to the massive variety occupying a large portion of a lobe. The liver weighed from 1,500 to 7,000 Gm. with an average weight of 3,300 Gm. Our cases, on microscopic study, were similar to those described in the literature, that is, those with trabecular structures, mature cell type, immature cell type and giant cell forms, and combinations with bile duct proliferation.[16] In addition, we observed a

*Read before the Section on Pathology, Southern Medical Association, Fifty-Second Annual Meeting, New Orleans, La., November 3-6, 1958.

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TABLE 2

SURVEY OF MALIGNANCIES DURING 1946-1957
VETERANS ADMINISTRATION HOSPITAL,
NEW ORLEANS, LA.

		Per Cent
Total Autopsies	1747	
Lung	167	9.0
Gastrointestinal	152	8.1
Lymphoma, etc.	108	6.0
Mouth, pharynx, etc.	74	4.3
Brain	63	3.6
Miscellaneous	159	9.1
Hepatoma	18	1.02
Total primary malignancy	741	
Hepatoma: Total malignancies	18: 741	2.4

sarcomatous variant which we believed was derived from Kupffer cells similar to Burston's.[17]

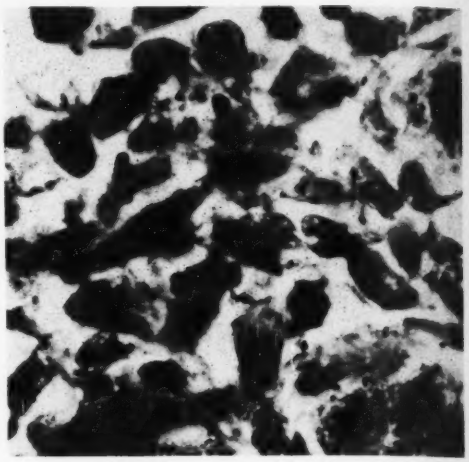
Metastases to various organs were common in this series. Lungs were the most common site, occurring in 11 instances; metastases to the adrenal and lymphnodes, each in 5 cases; peritoneal seeding in 3 instances; to the bone in 2 instances; and to the heart and kidney, one each. The tumor invaded the portal vein in 10 patients, inferior vena cava in 4 cases and the right auricle in one patient.

As a comparison with other primary malignancies, hepatomas were relatively uncommon, making up only 2.4% (Table 2).

Eleven patients with hepatomas had cirrhosis. During the period of this survey, autopsies were performed on 77 patients with Laenec's cirrhosis. One patient had a hepatoma associated with hematochromatosis with large quantities of demonstrable iron in all tissues. The tumor was associated with 9 cases of esophageal varicosities, and 5 patients had large quantities of blood in the stomach.

Because of the rarity of Kupffer cell sarcomas, this case is being presented in detail.

FIG. 2

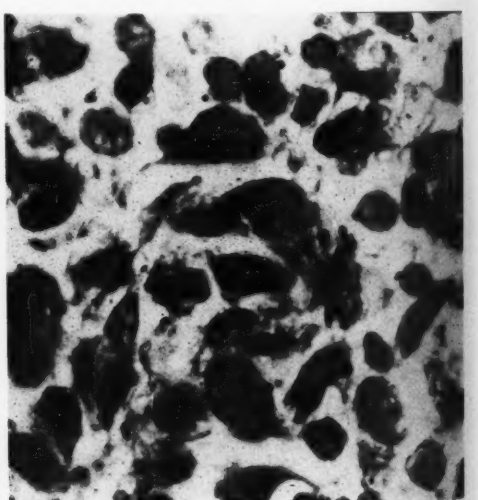


The Kupffer cells are beginning to elongate and many are lying free in the sinusoids among the atrophic liver cells. (H. & E. x 380.)

FIG. 1

Liver cells are lined by hypertrophied Kupffer cells, a few of which also lie free in the sinusoids. (H. & E. x 380.)

FIG. 3



The Kupffer cells are polyhedral with large vesicular and hyperchromatic nuclei and are free in the sinusoids. (H. & E. x 380.)

The patient was a 64 year old white man who, 2 months prior to admission developed a low-grade fever, cough, and malaise. Later, he developed epigastric pain and abdominal swelling.

Past history revealed that in 1936 he was in another hospital for jaundice and ascites. He drank 6 to 12 bottles of beer daily and ½ pint of whiskey per week.

Physical examination showed spider angiomas over the neck. The liver was enlarged and tender. An elevated diaphragm was noted on x-ray study of the chest. Laboratory findings were: leukocytes of 16,600 per cu.mm. with 93% neutrophils; serum albumin and globulin were 2.9 Gm.% each; serum bilirubin, 2.7 mg.%; cholesterol, 176 mg.%; alkaline phosphatase, 9.4 units; bromsulphalein retention of 43%; urea, 53 mg. per cent.

Course in hospital. The patient was given cortisone, but developed ascites rapidly and a volume of 2,600 cc. of ascitic fluid was removed. Shortly afterwards, the patient went into coma, vomited brown coffee ground material and expired.

Necropsy Findings

The peritoneal cavity contained 500 cc. of a pale yellow fluid. The liver weighed 3,175 Gm. with a prominent dome-like protuberance on the inferior border. The cut sections showed numerous soft hemorrhagic nodules, 1.0 to 2.0 cm. in diameter. The intervening areas were cirrhotic. There was no invasion of the blood vessels by the tumor. Microscopically, there was a proliferation of cells adjacent to the liver cords where the Kupffer cells were normally encountered. These neoplastic cells separated from the nearby liver cells and resembled cuboidal cells with large vesicular nuclei. They subsequently became elongated to produce masses of sarcoma cells. In some areas they arranged themselves suggestive of blood vessels. Mitoses were infrequent. The stroma was scant. No metastases were observed (Figs. 1 to 5).

FIG. 4

The Kupffer cells are elongated with spindle-shape nuclei and eosinophilic cytoplasm. They are compact with no obvious supporting stroma or blood vessels. (H. & E. x 380.)

FIG. 5

The Kupffer cells appear sarcomatous and are forming spaces which are partially filled with blood. (H. & E. x 380.)

Summary

Eighteen cases of primary carcinoma of the liver were encountered among 1,747 autopsies, a frequency of 1.02 per cent. The most common associated pathologic process was cirrhosis which was present in 61% of those with carcinoma of the liver cell. Upper abdominal pain, weakness, anorexia and weight loss were the prominent symptoms and the diagnosis was made by needle biopsy in 8 instances. A case of Kupffer cell sarcoma was presented.

Acknowledgment

The authors wish to express their sincere thanks to Mr. William Bohon and Mr. Tom Morris for their photographs.

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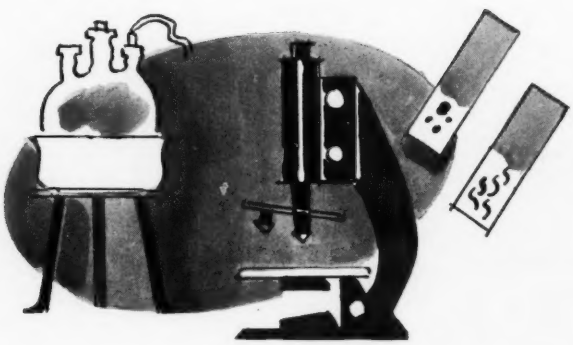

Utilization of the Short Saphenous Vein in Cut Down Procedures

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IN CRITICALLY ILL PATIENTS the readily available veins are frequently destroyed by repeated intravenous infusions. It is the purpose of this report to call attention to a constant vein which can be utilized for insertion of a canula under these circumstances.

The short saphenous vein is formed by the veins in the dorsum and plantar surfaces of the foot. It passes posterior to the lateral malleolus and ascends superiorly in the subcutaneous tissue to the popliteal space where it transgresses the deep fascia to enter the popliteal vein.

Technic. A one inch intracutaneous wheal is made with a local anesthetic midway between the posterior border of the lateral malleolus and the Achilles tendon. A longitudal incision is made through the skin and the small venous branches visualized (Fig. 1). The major trunk of the short saphenous vein lies in the loose adipose-areolar tissue in this area. Frequently the small venous tributaries can be traced to the short saphenous vein and used to differentiate this vein from the sural nerve which lies more posterior. Once the vein has been identified, the canula or catheter is inserted in the usual manner. Since the short saphenous vein communicates directly with the deep veins of the leg, it is important that the canula be removed before an ascending phlebitis occurs. It has been our practice to use this vein for no longer than 48 hours.

Summary. A method is described wherein the short saphenous vein is utilized by a cut down procedure for the administration of parenteral fluids.

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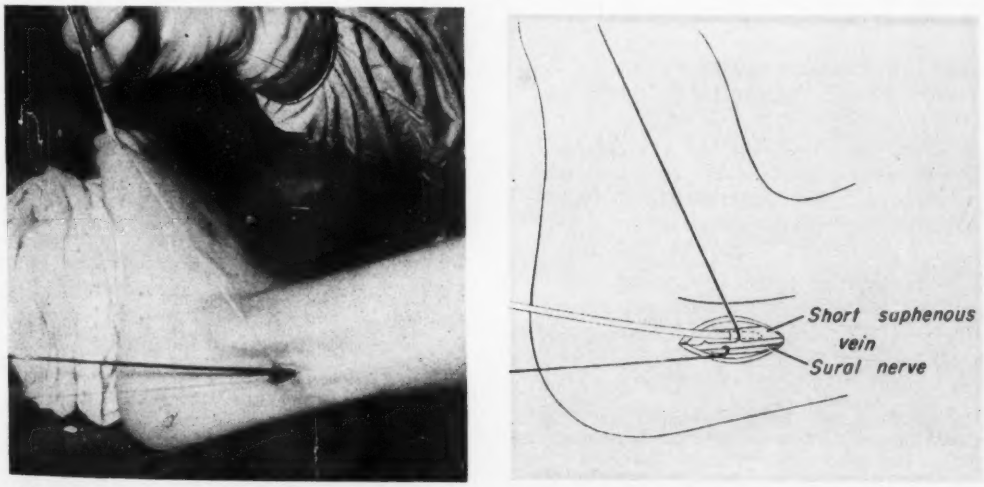
FIG. 1



Photograph and line drawing which demonstrate a polyethylene catheter in the short saphenous vein and the relationship of the sural nerve.

CASE REPORT

Radiographic Findings in Whipple's Disease

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THIS CLINICAL ENTITY, described first in 1907, is being reported more and more often in the world literature, 70 cases according to latest articles.[1] However, very few cases have been found in females, and arthritis, clinically evident, has resulted in radiographic changes in very few instances.[2] These 2 unusual situations prompt the report of this case. We will deal mainly with the radiographic findings.

Pathogenesis

The etiology of this disease is unknown; however, the pathogenesis resembles, to some extent, that of histiocytosis. Some believe that this disease may be "another manifestation of rheumatic state or collagen disease."[3] Allergy,[4] chronic infectious lymphadenitis[5] also have been considered, while Whipple believed that it was the result of defective fat metabolism. Others, like Puite,[6] think that a genetic factor is involved.

The main pathologic change is deposition of foamy macrophages containing glycoprotein. Identical types of cells are found disseminated through mesenteric and peripheral lymph nodes, liver, and at the site of inflammation of endocardium and elsewhere.[7] The glycoprotein is identifiable with the Schiff's periodic acid stain. Lipoid deposits, until recently considered incorrectly to be the basic pathologic lesion,[7] accounted for the misnomer "lipodystrophy."

The infiltration of macrophages results in a thickened mucosa in the small bowel, and the same mechanism causes lymphadenopathy through the body. The joint changes are usually those of polyserositis, although rarely destruction of joint cartilage and bone may occur probably secondary to pannus formation. The serosa lining of any of the body cavities may be involved with effusion; thus ascites, and pleural and pericardial effusion may be found as well as increased synovial fluid.

Clinical and Laboratory Findings

Clinical signs and symptoms such as polyarthritis, diarrhea, weight loss, abdominal pain, bloating, fatty stools, chronic productive cough, enlargement of lymphatic nodes, emaciation, hypotension, purpura, pigmentation of the skin, edema, fever, disorders of the central nervous system are associated and frequent in this disease.[2] It has a downhill course that leads to death within a few years. The usual onset occurs with diarrhea (50%) or arthritic symptoms (50%), both of the symptoms sometimes occurring together, but there is no definite pattern.

Other abnormalities are found by means of laboratory studies. These are: anemia of a hypochromic or normochromic microcytic type; defective fat absorption and decreased or absent absorption of protein; gastric achlorhydria; increased fecal fat; flat oral glucose tolerance curve;[1] hypocalcemia.

Radiographic Findings

From the radiographic standpoint, there are 2 kinds of changes that should lead to the suspicion of this entity,—these are changes in intestinal pattern and findings not related to the intestine. Martel and Hodges[1] describe very carefully all of the possible changes encountered in the small intestine. It seems, however, that the *main radiographic findings* are thickening of the mucosal folds and segmentation and flocculation of barium. Absence of dilatation of the lumen of the bowel

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and lack of involvement of the stomach or colon represent *negative signs* which are suggestive. The "moulage sign"[8] described as "missing of the valvulae conniventes and smooth filling of the lumen, as though wax had been poured into it and allowed to harden," although detected in advanced cases,[1] was not seen in ours.

The extraintestinal manifestations are certainly striking and they are recognized as enlargement of lymph nodes in the hilar region, mediastinum and retroperitoneal space.[9] There may also be true arthritic changes manifested by narrowing of the joints, serrations of articular surfaces, and sclerosis affecting particularly sacro-iliac and hip joints which are compatible with the Marie Strümpell type of arthritis;[9] some articles have spoken of these findings as "arthritic-like changes."[10] In the case presented here, the findings were compatible with those seen in advanced rheumatoid arthritis and developed rapidly. In a period of 16 months, the normal appearing shoulder joints developed pronounced re-absorption of the humeral heads, widening of the glenoid fossa, osteoporosis and radiographic impression of subluxation of the left shoulder. Mild changes consisting of osteoporosis and slight narrowing of the joint spaces were seen in both wrists.

Differential Diagnosis

It is true that similar radiographic abnormalities of the bowel can be found in such diseases as sprue, tropical or nontropical, steatorrhea of pancreatic origin, chronic inflammation of the small bowel, scleroderma, amyloidosis, or in any tumor or condition that involves the retroperitoneal space and consequently obstructs the free flow of lymph through this route. However, the bone or joint abnormalities described are not caused by these diseases. In every one of the above mentioned diseases, there are other roentgenographic, clinical and laboratory signs that may help to reach the correct diagnosis.

In *sprue*, as opposed to Whipple's disease, both the small and large bowel are dilated and macrocytic anemia is almost a constant finding. In *steatorrhea of pancreatic origin*, flocculation and segmentation of barium plus some degree of dilatation in the small intestine may be seen, but very rarely are such marked changes noted in Whipple's disease. In *idiopathic steatorrhea* roentgen changes in the small intestine, colon, gallbladder and bony skeleton are identified.[8] The "moulage sign" is more characteristically seen here; the colon is dilated and redundant; there is faint visualization of the gallbladder with contrast media; and dwarfism, bone deformity and osteoporosis are present.

Scleroderma of the gastrointestinal tract is most commonly found in the esophagus, though the lower segments of the gastrointestinal tract may be involved later.

Tumors of retroperitoneal space which produce displacement of the loops of the bowel or other organs are immediately suspected but, if displacement is not produced, they can give a picture similar to that of Whipple's disease. However, arthritic changes are unlikely to be part of the tumor picture.

Amyloidosis can give thickening of the mucosal folds.[11] In the early phases of chronic inflammation of the small bowel, the mucosal folds may be thickened;[12] in addition, loops are rigid and separated from one another due to increased thickness of the wall, and there is no segmentation. In Whipple's disease there is no ulceration of the mucosa as may occur with inflammatory lesions.

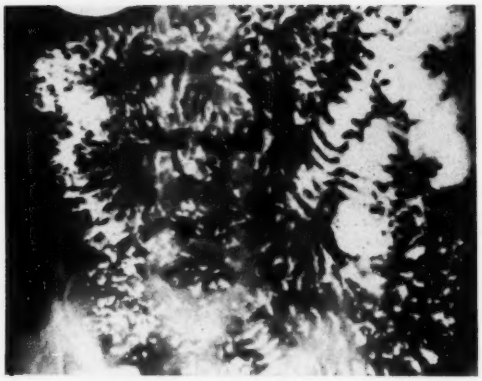
Case History

R. R., a 38 year old white housewife, complained of loose, foul stools, brown, floating, malodorous, voluminous and greasy, for 6 years. There had been progression of the disease with 9 different periods of hospitalization.

The symptoms began with complaints of chills, fever, nausea, vomiting, and abdominal cramping. The blood pressure oscillated with a minimum of 100/65 to a maximum of 135/75. As time passed, emaciation and marked loss of weight from 110 pounds to 70 pounds occurred. The final attack of diarrhea occurred in June, 1958, with constant abdominal gaseous distention and a steadily increasing pitting edema until the patient finally expired on Sept. 8, 1958.

On different occasions, the patient presented bright red spots on the arms and wrists; the skin was pale but with yellowish-brown pigmentation. A chronic productive cough was constantly present. In December, 1956, the cervical glands of the left side of the neck were tender and enlarged. In January, 1957, she complained of pain in the right shoulder, but x-ray studies revealed negative shoulder joints. This pain progressively increased and spread to other joints, including elbow, wrist, and joints of the fingers and hands, which showed occasional redness, edema, swelling, and tenderness. Repeated radiographic studies of the G.I. tract, urinary system and bones failed to demonstrate any abnormality except for one study of the small

FIG. 1



Marked accentuation of the valvulae conniventes due to infiltration of the mucosa by macrophages but without evidence of dilatation of the lumen of the bowel.

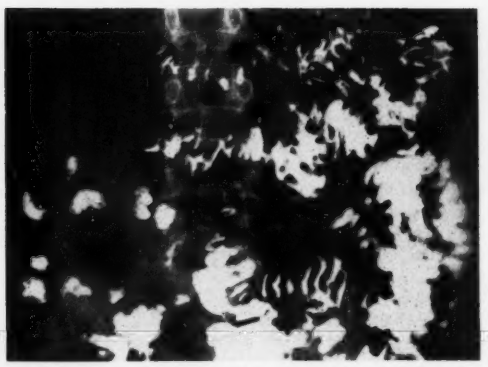
bowel that was reported as showing a pattern consistent with "nontropical" sprue. A more careful and retrospective study of the jejunum and ileum presented thickening of the mucosal folds but with a normal width of the lumen; segmentation and flocculation of barium were present but not a prominent feature. No pathologic changes of stomach or colon were seen (Figs. 1 and 2).

Radiographs of the joints demonstrated marked rheumatoid-like changes (Figs. 3, 4 and 5). There was an impression of chronic subluxation of the left shoulder. Clinically, there was no rotatory motion in the left shoulder and decreased motion of the elbow.

Laboratory studies demonstrated iron deficiency microcytic anemia, probably due to chronic blood loss. The total serum protein was 7.8 Gm. in March, 1956, and progressively dropped to 5.7 Gm. prior to death. The A-G ratio showed some decrease from 4.3:3.5 to 2.9:2.8. The fasting blood glucose was 77 mg. per 100 cc. A radioactive Schilling test gave a normal vitamin B_{12} uptake. A triolein test dose of 100 millicurie in 34 cc. of peanut oil gave a result interpreted as poor fat absorption.

The VDRL. test was negative. In the cerebrospinal fluid the protein was 34 mg., glucose, 49 mg., and chloride, 121 mg. per 100 cc. The Pandy test was negative, as was the colloidal gold curve.

FIG. 2



The bowel lumen has maintained a relatively normal width, although thickening of the valvulae conniventes is again a prominent finding with some associated segmentation and minimal flocculation. This examination was made 3 months after one illustrated in Fig. 1.

FIG. 3

The most prominent feature is osteoporosis and atrophy of the soft tissues. Minimal narrowing of the interphalangeal joints and moderate narrowing of the wrist joints are also present.

FIG. 4

The bilateral bony resorption of the humeral heads and of the glenoid fossas, with slight cephalad subluxation, is well shown.

FIG. 5

View of the left shoulder demonstrates the marked bony resorption with the resultant shallow glenoid fossa and slight subluxation. Cystic changes can be seen in the humeral head.

In April, 1957, a new factor was added to the clinical picture consisting of muscular twitches in the neck and arm of the right side. These were involuntary movements involving the head, upper limbs, neck, and lower limbs, occurring about once per second, rhythmical and slow, accompanied by turning of the head to the right, flexion of both forearms, and flexion extension of the left foot. A few months later, a surgical chemopallidectomy was recommended, but this procedure was never performed. On different occasions, many provisional diagnostic possibilities were considered. They were: insufficiency of the pancreas due to external secretions, pellagra, pernicious anemia, idiopathic steatorrhea, secondary sprue, Addison's disease, Simmond's pan-hypopituitarism, and occult malignancy.

The dyskinesia also was given different diagnostic possibilities. Among them were: Wilson's disease, parkinsonism, Huntington's chorea, chronic hypocalcemia, hysteria and "conversion reaction."

The patient expired and the final pathologic report included the following as the most important anatomic findings:

"Intestinal lipodystrophy" (Whipple's Disease).

Macrophagocytosis and lipidosis of mucosa of duodenum, jejunum, ileum and proximal colon.

Lipogranulomatosis of mesenteric and adjacent retroperitoneal and mediastinal lymph nodes.

Obliterative macrophagic lymphangitis of mesentery and of liver (portal triads).

Pericarditis, chronic fibro-adhesive.

Massive focal subacute necrosis of liver.

Pneumonia, focal bilateral.

Septicemia (terminal, possibly *Ecch. coli*—autopsy culture).

The patient's death was attributed to pneumonia and septicemia superimposed on extreme cachexia.

Summary

One of the very rare cases of Whipple's disease in a woman, with marked changes in the small bowel and joints, is presented.

Changes in the small bowel were thickening of mucosal folds, segmentation and flocculation of barium, but no dilatation of the lumen of the bowel or involvement of any other segments of the gastrointestinal tract. The changes in the shoulder joints were extremely marked, developed rapidly, and resembled the changes usually associated with rheumatoid arthritis. A central nervous system syndrome, unexplained but sometimes seen in this disease, was also present.

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Reactions of Soft Somatic Tissue Which May Progress to Bone Formation: Circumscribed (Traumatic) Myositis Ossificans*

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Myositis ossificans is a term about which there is much confusion. It is used here in a sense related to the formation of new bone following trauma to soft tissues. The lesion may appear at several anatomic sites dependent upon circumstances.

THE TERM "myositis ossificans" is unsatisfactory in several respects, but it has the substantial advantage of long usage and wide acceptance. Although the process may be imperfectly understood, the reference of the term is clear. It refers to the localized formation of heterotopic, non-neoplastic bone or cartilage that results from physical trauma and usually occurs in or adjacent to muscle and in proximity to bone.

Nevertheless, various manifestations of the process regularly masquerade under other terms. These terms usually fail to convey the significance of the lesion, and in some instances are without meaning. Misdiagnosis, sometimes with the gravest consequences, is rather common.

Although we have found the term myositis ossificans useful, we are persuaded after extensive clinical and experimental studies that the implications of the diagnosis should be more comprehensive, and that a classification should be designed that includes all manifestations of the process. The definition which we use is not a radical departure, but a logical extension of the currently accepted one. We define myositis ossificans as the total of all soft somatic tissue reactions which follow trauma and which may progress to the formation of bone or cartilage. In this we implicate the process as well as the product. This is essential in understanding the lesion. The definition includes associated reactions which may not be related to bone formation, but which are integral parts of the histologic characteristics of the lesion.

Trauma, as we understand it here, includes all types: isolated episodes of severe character, repeated or recurrent moderate trauma, and minor intermittent or sustained trauma which may be almost imperceptible. In some instances we refer to this minor trauma as inferential trauma. It is also reasonable to believe that tissue changes which may progress to bone formation occur for reasons other than physical trauma in the usual sense.

Since muscle commonly but not invariably is involved, and since the more significant changes appear in other tissues as well, we have implicated all soft connective tissue. Specifically, this includes fascia, tendon, and periosteum. We believe that in most instances it is fascial connective tissue that is predominantly involved in bone formation.

The classification which we use is quite simple (Table 1). It is primarily topographic or spatial; it is histogenetic only in that it indicates the principal tissue or tissues in which the lesion arises. However, it is based in part upon morphogenesis, because the form of the lesion and the locale in which it develops are of great importance in determining the clinical features. Here the concern is more with where bone forms than how it forms. The

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TABLE 1

Classification
I. Extra-osseous
A. Diffuse
B. Fascial
C. Tendinous
II. Periosteal
III. Parosteal
A. Combined (extra-osseous and periosteal)
B. Secondary (an extension of extra-osseous)
C. Fascial and tendinous (insertions)

bone which forms is normal bone, modified not in kind but in form by its location and by other tissue reactions which may develop concurrently in the same area. These reactions obscure and complicate the histologic picture and thus are of great importance in interpretation, but they do not alter in any respect the fundamental process. Consequently, our concern is not with abnormal bone formation but with bone formation in an abnormal location.

In regard to bone formation it is only necessary to emphasize the well-established fact that one of the prerequisites is a peculiar alteration within the ground substance of connective tissue, almost always associated with a striking proliferation of undifferentiated mesenchymal cells. Although other factors may properly be disregarded it is well to recall that this is one of the fundamental unsolved problems in biology.

Our definition clearly includes processes which are regarded as normal. The muscular callus which develops about a fracture is an excellent example. In this sense the process is always physiologic. Certainly there are a number of processes which might be identified as myositis ossificans which never give evidence of their existence. Lesions come to notice only when they cause symptoms or are regarded as abnormal growths.

The histogenesis of these lesions will vary considerably both quantitatively and qualitatively, depending upon the extent, severity, and precise localization of the trauma. Furthermore, the histogenesis of different forms of myositis ossificans may be essentially the same or, as our classification indicates, there may be a combination of tissue reactions. It is therefore necessary to appreciate the variety of changes which may occur within these tissues, and to understand the evolution of these changes to be able to apply the diagnosis to the wide gamut of lesions which develop.

The following discussion represents the synthesis of our observations upon 23 cases (Table 2) which we have classified as myositis ossificans, our experimental studies, and a review of all pertinent reported studies.

Trauma and Its Results

When a large muscle mass is subjected to severe isolated trauma, a striking sequence of events ensues.[1-4] The damaged area is roughly spherical with maximum damage at the center. Hemorrhage, which is usually associated, centers about the area of greatest damage. Initially there is degeneration and necrosis of tissue and retraction of disrupted muscle fibers. There follows a tide of histiocytic invasion in which necrotic debris is removed. Calcification of damaged muscle fibers may be marked. This is a transient phenomenon and does not appear to be related to subsequent bone formation.

Within 3 or 4 days fibroblasts from the endomysium extend into the damaged area and rapidly form broad sheets of immature fibroblastic cells. At the same time primitive mesenchymal cells proliferate within the injured fascia and other connective tissue. It is within these tissues that ossification occurs, but it is not yet decided whether ossification occurs in both of these proliferating tissues, or in the tissue arising from fascia only. It is pertinent to note that this immature mesenchymal and fibroblastic tissue is sometimes erroneously diagnosed as fibrosarcoma or myosarcoma.

Simultaneously, sarcolemma nuclei at the ends of damaged muscle fibers begin to proliferate. First, chains and columns of plump, polyhedral cells appear. Within a very short time the production of sarcoplasm becomes evident in buds, straps, or club-like projections which are in continuity with preexisting fibers, and the sarcolemma nuclei cluster in the centers of these masses. As these buds encounter obstructions in the form of clot, granulation tissue, or proliferating endomysium, they are blunted, turned aside, or made to branch. One may observe rather large areas entirely occupied by these multinucleated muscle buds. Microscopically, this may be confusing, and at times may prompt the diagnosis of giant cell tumor or myogenic sarcoma.[4]

TABLE 2

Case	Age	Sex	Location of Lesion	History of Trauma	Duration of Symptoms	Roentgenographic Findings	Operative Findings and Gross Description
1	14	M	L. brachialis anticus	Hurled by explosion	2 yrs.	A bridge of bone from the humerus to the coronoid process of the ulna	A solid bridge of bone in brachialis muscle from humerus to ulna
2	22	M	Soft tissue overlying middle third L. femur	Struck playing football	4 yrs.	A well-delineated mass of bone attached to the anterior femoral cortex	A 15 cm. mass of bone adherent to anterior femoral cortex
3	17	M	R. brachialis anticus	Struck playing football	4 mos.	A bridge of bone from the humerus to the coronoid process of the ulna	A solid bridge of bone brachialis muscle from humerus to ulna
4	15	F	R. brachialis anticus	Fell while skating	7 mos.	A large mass of bone in the antecubital fossa, attached to the humerus	A 2 by 6 cm. cylinder of bone in brachialis muscle, attached to the humerus
5	12	M	Interval between deltoid and triceps muscle, L.	Fell from horse	1 yr.	A rounded calcified mass posterior to the proximal humerus; "onion peel" periosteal reaction	A circumscribed mass 5 by 4 by 4 cm., not attached to bone
6	30	M	R. quadratus femoris muscle	Beaten and kicked	7 mos.	A large mass of calcified soft tissue in R. buttock	A 7 by 5 cm. cylinder of bone replacing quadratus femoris muscle; attached to trochanter but not to pelvis
7	14	F	Medial head of R. gastrocnemius muscle	None	1 mo.	A circumscribed, irregularly calcified mass in R. popliteal space	A circumscribed mass 5 by 4 by 4 cm. in medial head of R. gastrocnemius muscle. Investing fascia split to surround lesion
8	17	M	Overlying the anterolateral cortex of the R. femur, middle third	Struck playing football	6 mos.	Well-organized mass of bone overlying R. femoral cortex	A plaque of bone 9 by 3 by 1 cm. adherent to the anterolateral aspect of the femoral cortex beneath the vastus lateralis muscle
9	11	M	Anteromedial aspect of the R. upper tibia	Repeated trauma over period of 2 years	2 yrs.	A large, heavily calcified mass, within confines of static periosteal bone; destruction of adjacent cortex	A large sessile exostosis attached to the tibial metaphysis; portions of underlying cortex eroded
10	15	M	Overlying the lateral cortex of the L. femur, proximal third	Pulled muscle playing football	18 mos.	A projection of mature-appearing bone on lateral femoral cortex 3 inches below greater trochanter	A piece of normal appearing bone adherent to the lateral femoral cortex and projecting into the vastus lateralis muscle
11	17	M	R. flexor carpi radialis tendon	None	11 yrs.	A well-demarcated calcified mass in soft tissues on anterior aspect of the wrist	A circumscribed ossified lesion 1 cm. in diameter, within substance of tendon
12	14	F	L. lumbosacral area	Struck back against wall playing basketball	3 mos.	A destructive lesion with erosion of L. transverse process, pedicle, and part of body of L-5	A thick-walled mass 7 by 5 by 4 cm., with large blood-filled spaces, lateral to and involving body of L-5, extending into erector spinae, and eroding transverse process and pedicles
13	21	M	R. brachialis anticus	R. arm was struck in fight	3 wks.	A mass 2.5 cm. in diameter of poorly defined calcification anterior to humerus at junction of middle and distal thirds	A well-circumscribed, calcified mass, 2.5 cm. in diameter, in belly of brachialis muscle; not attached to bone
14	66	F	At site of transverse fracture of R. femur, junction of proximal and middle thirds	Fell down steps	1 wk.	Transverse fracture of R. femur at junction of proximal and middle thirds. No evidence of pre-existing pathology	Transverse fracture of R. femur. Grayish friable tissue around fracture site and extending into surrounding muscle
15	21	F	Seventh R. rib at anterior axillary line	None	2 wks.	Destructive process seventh right rib in anterior axillary line resembling fracture; surrounding new bone	A calcified lesion 2 by 1.5 by 1 cm., entirely subperiosteal, surrounding seventh rib
16	64	M	Lateral aspect of distal R. femur	Horse fell on knee	5 yrs.	Large irregularly calcified mass projecting anterolaterally from distal femoral metaphysis	Large projection of cartilage and finely trabeculated bone arising by a broad base from distal femoral metaphysis

(Continued on page 1436)

ANALYSIS OF CASES

Microscopic Description	*Clinical Diagnosis*	*Original Pathologic Diagnosis*	*Follow-up*	*Classification*	*Remarks*
Organoid arrangement of mature bone	Osseous ankylosis secondary to trauma	"Mature bone"	2 yrs.	Parosteal	The classic type
Organoid arrangement of mature bone	Ossifying subperiosteal hematoma	"Osteocartilaginous body"	5 yrs.	Parosteal	The lesion recurred, and was gradually incorporated into the cortex
Organoid arrangement of mature bone	Myositis ossificans	"Atypical bone"	16 mos.	Parosteal	
Organoid arrangement of mature bone	Ossifying hematoma	"Ossifying hematoma"	8 yrs.	Parosteal	
Highly cellular fibroblastic and mesenchymal tissue, with osteoid and woven bone; zonal pattern	Malignant tumor	"Myositis ossificans"	2 mos.	Extraosseous lesion arising in fascia	
Organoid arrangement of mature bone	Ossified hematoma	"Myositis ossificans"	3 mos.	Parosteal	
Highly cellular fibroblastic and mesenchymal tissue, with osteoid and coarse woven bone; zonal pattern	Myositis ossificans or malignant tumor	"Myositis ossificans"	3 mos.	Extraosseous, arising in fascia	
Organoid arrangement of mature bone	Ossifying hematoma	"Myositis ossificans"	1 mo.	Parosteal	Roentgenograms 3 wks. after operation showed that the lesion had recurred; it was slightly larger than before
Bizarre conglomeration of mature and immature cartilage and bone, and cellular fibrous tissue	Chondromyxosarcoma, or ossifying hematoma	"Osteochondroblastoma of low-grade malignancy"	6 yrs.	Parosteal, involving subjacent bone	An above-knee amputation was performed after biopsy
Organoid arrangement of mature bone	Myositis ossificans	"Myositis ossificans"	5 wks.	Parosteal	Roentgenograms 5 wks. after operation showed that the lesion had recurred; it was about the same size as before
Organoid arrangement of mature bone	Tumor of soft tissues, R. wrist	"Ectopic calcification and bone formation"	None	Extraosseous, in tendon	
Capsule containing immature woven bone; proliferating fibroblastic stroma; marked giant cell reaction	Soft-tissue malignancy, or aneurysmal bone cyst	"Myositis ossificans"	2 yrs.	Parosteal, involving bone—a form of aneurysmal bone cyst	Roentgenograms 1 yr. after operation showed an organized bony mass in the same area, slightly larger than the original lesion
Organoid arrangement of mature bone	Myositis ossificans	"Myositis ossificans"	2 mos.	Extraosseous	
Highly cellular fibroblastic tissue; marked regeneration of muscle; early bone and osteoid	Traumatic fracture of R. femur	"Sarcoma, unclassified"	14 mos.	Parosteal; actually muscular callus	
Well-organized subperiosteal bone and cartilage	Tumor of rib; possibly a healing fracture	"Healing fracture," or "osteochondroblastoma"	18 mos.	Periosteal	The lesion recurred 4 mos. after operation, but was static and asymptomatic 18 mos. after
Well-organized mature bone; considerable necrosis	Chondrosarcoma	"Myositis ossificans"	None	Parosteal, undergoing avascular necrosis	The patient died of pyelonephritis before leaving the hospital

(Continued on page 1437)

TABLE 2 (continued)

Case	Age	Sex	Location of Lesion	History of Trauma	Duration of Symptoms	Roentgenographic Findings	Operative Findings and Gross Description
17	62	M	Entire anterior compartment R. leg	Compound fracture of R. tibia	27 yrs.	Irregular calcification of soft tissues of anterior compartment of R. leg	Muscles of anterior compartment partially necrotic; diffuse calcification and bone formation
18	22	M	R. popliteal space	Auto accident; paraplegia; passive stretching of R. knee for flexion contracture	9 mos.	Large irregular calcific mass in R. popliteal space arising from posterior superior tibia	An osseous mass 7 by 2 by 3 cm. arising from posterior superior tibia and extending proximally; fibers of posterior knee capsule interdigitated
19	18	F	L. popliteal space	None. Ecchymosis over L. popliteal space on first visit	3 mos.	Soft-tissue swelling in R. popliteal space; no calcification	A thick-walled cavity 6 by 3 by 2 cm. between semimembranosus and semitendinosus muscles, filled with clotted blood
20	53	F	Overlying linea aspera, L. femur	None	6 mos.	A well-circumscribed osseous mass overlying the posterior femur at the level of the lesser trochanter	A mass of bone 3.5 by 2 by 1 cm. overlying the linea aspera. The lower fibers of gluteus maximus inserted into the mass
21	44	M	R. patellar tendon	Fell hard on knee; ruptured patellar tendon	4 yrs.	Scattered, heavily calcified areas in patellar tendon	Dense scar and spicules of bone in tendon
22	83	F	Lower outer quadrant of L. breast	None	4 mos.	None	Circumscribed oval mass beneath superficial fascia adjacent to breast
23	51	F	Over R. sacroiliac joint	Quinine injections	2 yrs.	Oval area of calcification over lumbosacral joint	A firm calcified mass within lumbar fascia, 3 by 1.5 cm.

Within the proliferating mesenchyme, significant changes occur in the matrix or ground substance. This material becomes more homogeneous, and glassy or waxy; as Leriche and Policard[5] suggested it seems to be a form of edema. This material, in which are seen indistinct, delicate fibrils, may be almost colorless or moderately eosinophilic. This initial change is not associated with any significant alteration in distribution of cells. The ground substance increases in volume or coalesces, incorporating some of the mesenchymal cells which cluster about these areas, and assumes the histologic characteristics of osteoid. It then is apparent that the mesenchymal cells have morphologically and geographically become osteoblasts. Calcium is deposited and bone is formed.

This sequence of events occurs first in tissues least damaged, usually at the periphery.[4] Then, as the evolving lesions become ossified, this occurring lastly or not at all in the more severely damaged areas, a zonal pattern develops. If there has been considerable hemorrhage in the central portion, large lakes of blood may form with osteoclastic and foreign body giant cells about them. In some instances the regenerating muscle fibers are prominent in these areas and further exaggerate the giant cell tumor picture.

When the changes are confined primarily to fascia, the histogenesis is altered in that muscle does not actively participate. Perhaps even more than muscle, fascia is regarded as a rather inert tissue. The fact that highly malignant tumors arise in both should have dispelled this idea. There is no doubt that fascia may react quite violently to trauma and produce a highly cellular mesenchyme in which conditions necessary for ossification clearly exist. Bone may also form within a tendon in just such a fashion.

With regard to tendons, there may be observed at the point of muscular origins and insertions a gradual development of an exostosis. This may be an exaggeration of a normal process, or may be an entirely new structure. The histogenesis of this process is not entirely understood. One observes simultaneously a mucinous change within the tendon and an exaggerated osteoblastic activity in the bone beneath it. There is a suggestion that the mucoid alteration progresses to cartilage and thence to bone. Regardless of whether one or both of these processes are effective, an exostosis is produced.

Periosteal reactions are probably better understood and more widely appreciated than other reactions. It is well established that when the periosteum is elevated the space

ANALYSIS OF CASES

Microscopic Description	*Clinical Diagnosis*	*Original Pathologic Diagnosis*	*Follow-up*	*Classification*	*Remarks*
Dense mature bone in fascia; considerable necrosis	Chronic infection, R. leg	"Calcification and ossification in necrotic tissue"	None	Extra-osseous	The associated infection is unusual
Well-organized bone in continuity with fascia; area of cartilage at zone of transition	Myositis ossificans	"Osteochondroma"	3 mos.	Parosteal, arising in fascial attachment	Roentgenograms 2 mos. after operation showed partial recurrence
Highly cellular fibroblastic tissue with iron pigment	Organized hematoma	"Atypical fibroblastic reaction secondary to trauma"	3 wks.	Extra-osseous; no bone formation	
Well-organized and oriented bone with tendon fibers extending i..to superficial portion	Osteoid osteoma, or subperiosteal hematoma	"Myositis ossificans"	1 mo.	Parosteal, arising in tendon insertion	
Mature lamellar bone within tendon	Old rupture of patellar tendon	"Bone formation in tendon"	2½ yrs.	Extra-osseous, in tendon	
Highly cellular fibroblastic lesion arising from fascia; early osteoid and bone formation	Breast tumor	"Fibrosarcoma"	15 mos.	Extra-osseous, arising in fascia	
A fusiform bony mass, within fascia	Fibroma	"Myositis ossificans"	5 mos.	Extra-osseous, in fascia	

created becomes filled with new bone. This is particularly well illustrated in the margins of fractures during the formation of the periosteal callus. Essentially the same processes are responsible for involucrum formation in osteomyelitis and for periosteal reactions overlying certain tumors. Codman's reactive triangle is just such a process. The histologic changes which follow stripping away of the periosteum are hardly different from those which we have described in other connective tissues, except that bone forms much earlier here. Highly cellular connective tissue proliferates in the area between periosteum and bone, and in this tissue deposits of osteoid appear, and are rapidly converted to bone.

Extra-osseous Lesions

Extra-osseous myositis ossificans usually arises within the substance of a muscle, and always as a discrete mass in soft tissue without direct connection with bone. Bone first appears in about 3 weeks. Consequently, early roentgenograms reveal only a vaguely defined opacity with focal calcific flecks. Later a circumscribed mass of rather lacy texture develops. A sharply defined mass of dense bone eventually forms. In the past this final stage has been referred to as muscle osteoma or aberrant exostosis.

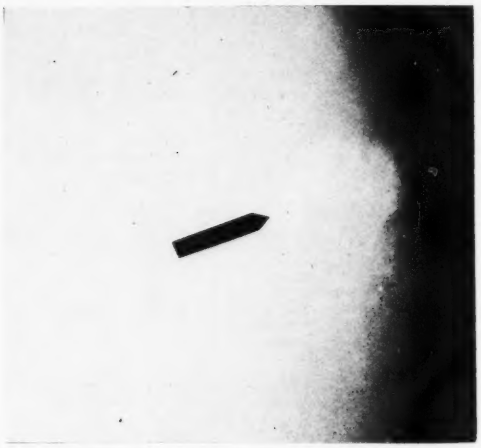
It is apparent that the form and orientation of these lesions, and the zonal pattern whose development has been emphasized, must depend to a considerable extent upon the muscular forces exerted during the healing process. For example, one may see an oval or cylindrical lesion with the more mature elements at one pole, the immature at the other. Johnson[4] has indicated that in areas where there is much interdigitation of connective tissue, in paravertebral locations specifically, the process may be unduly prolonged, and a zonal pattern may be absent. MacEwen[6] discusses in his classic monograph the effects of vigorous activity and repeated trauma upon the process. A zonal pattern is nevertheless present in most cases, and is of practical importance in diagnosis.

Case 7. A 14 year old white girl complained of pain of one month's duration in her right calf. The upper calf was swollen, warm, and slightly tender.

A roentgenogram (Fig. 1) showed a well-defined oval calcified mass of lacy texture in the medial head of the gastrocnemius. The superior pole was much the denser.

The lesion was excised with adjacent muscle (Fig. 2). It measured 5 by 4 by 4 cm., and was readily cut with a knife. The lesion had originated within the fascia investing the muscle; the fascia had split and partially surrounded the mass with fascial fibers extending into the substance of the lesion. There was a poorly-defined zone of tawny, myxomatous tissue

FIG. 1



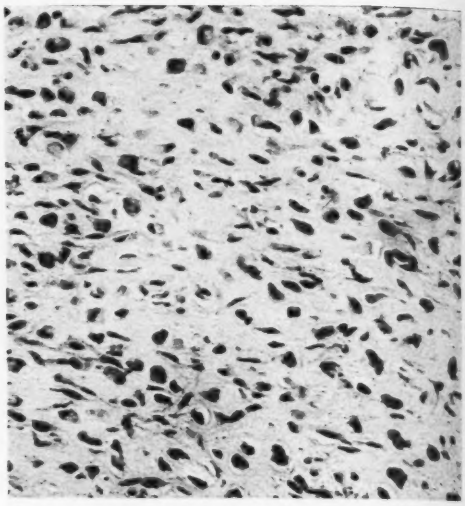
(Case 7) Roentgenogram showing the discrete calcification in the right gastrocnemius muscle. The lacy or feathery texture is characteristic of early stages of myositis ossificans. Note the greater density of the upper pole of the lesion.

about the lesion. In the area nearest the fascia the tissue was grayish-tan and myxomatous. At the opposite pole there was well-organized bone in a cauliflower arrangement. Thus, there was a well-defined zonal pattern. Histologically, the area immediately adjacent to fascia was composed of highly cellular mesenchyme in which early osteoid formation was seen (Figs. 3 and 4). Present at the opposite pole was well-oriented bone.

FIG. 2

(Case 7) Sagittal section of lesion removed from the gastrocnemius muscle. Note that the lesion has arisen in the investing fascia of the muscle, and fibers of this fascia partially surround and extend into the substance of the lesion. The zonal pattern is distinct.

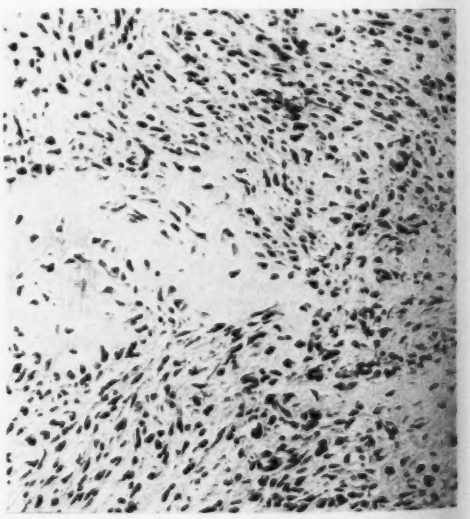
FIG. 3



(Case 7) Photomicrograph of tissue from the myxomatous area near fascia seen in figure 10. The ground substance of these mesenchymal cells shows the peculiar edematous swelling and homogenization which occur just before recognizable osteoid forms.

In this case the lesion was distinctly more mature at the upper pole, and the area nearer the fascia represented a much earlier stage in the process of bone formation. Interpretation

FIG. 4



(Case 7) Photomicrograph of an area a few millimeters removed from that seen in figure 8. Osteoid is recognizable as the homogeneous waxy areas containing a few mesenchymal cells, and partially surrounded by these cells which now have become osteoblasts. Elsewhere the stroma is a mixture of mesenchymal cells and fibroblastic cells. Such areas are easily confused with osteogenic sarcoma.

of this area alone, which so well illustrates the basic tissue changes initiating bone formation, would have been extremely difficult.

Many of the extra-osseous lesions seem to be confined primarily to fascia, and muscle is apparently not involved even in the earlier stages of the process. Although certain cases of extra-osseous lesions, such as the one reported by Geschickter and Maseritz,[7] illustrate quite well the organization of the lesion about a hematoma with diffuse muscle involvement, it is our impression that active participation of muscle is relatively infrequent. It may be because of the predominant involvement of fascia that these strictly extra-osseous lesions tend to have a polar orientation, rather than a circumferential one. Such may be attributed to the fairly constant tension exerted upon the lesion.

Case 5. A 12 year old white boy complained of pain of 3 week's duration in his right shoulder; then a mass appeared. This was explored but not biopsied. A diagnosis of malignant tumor was made and radiation therapy given.

He was first seen by us 2 months after the onset of symptoms. There was a firm, fixed mass over the posterior aspect of the upper shaft of the humerus. Roentgenograms (Fig. 5) showed a sharply circumscribed calcified mass, apparently arising from, or attached to the humerus. In some areas this had a delicate lacy pattern but in others was much denser, most markedly so at the superior pole. There was moderately extensive subperiosteal bone formation along the shaft of the humerus. This was the result of subperiosteal hemorrhage which occurred during the exploratory operation.

FIG. 5

(Case 5) Roentgenogram showing sharply defined bony mass posterior to and apparently attached to the proximal humerus. Periosteal reaction was caused by subperiosteal hemorrhage occurring during previous exploratory operation.

The mass, which was excised, was not attached to the humerus. The lesion measured 5 by 4 by 4 cm. and was covered by dense white fibrous tissue. It was sectioned with a knife. At the lower pole it was composed of soft, gray-white myxomatous tissue. Elsewhere there was well-oriented bone which was quite dense peripherally and at the superior pole. There was a distinct zonal arrangement. Histologically, the soft tissue was cellular mesenchyme in which osteoid was formed. This blended into fibroblastic tissue with active bone formation and thence into well-oriented woven bone.

The apparent involvement of bone seen in the roentgenogram in this case made the diagnosis difficult. If the presence of the associated periosteal reaction which developed after the first surgical exploration had not been properly appreciated, the diagnosis would have been much more difficult.

In those cases where trauma is more diffuse or less severe, many isolated areas of ossification may develop. There is indeed good evidence that when this process has been initiated, it may extend along contiguous connective tissue septa. Thereby a cylinder of bone is formed with anastomosing trabeculae throughout the lumen, isolating bundles of somewhat altered but viable muscle.

Case 6. A 30 year old white man was robbed and beaten into unconsciousness. He sustained severe contusions of the right hip and thigh. With constant pain in the hip, he gradually became more incapacitated in the ensuing months.

Roentgenograms revealed an elongated, sharply defined calcific mass attached to the gluteal tubercle, and extending medially and superiorly in the quadratus femoris muscle. There were smaller discrete areas of calcification adjacent to the larger mass.

At operation a roughly cylindrical mass of bone, 3 cm. in diameter and 7.5 cm. long, was found attached to the gluteal tubercle and extending into the quadratus femoris muscle. When sectioned, it was seen to be a cylinder with trabeculae coursing through the lumen in which were bundles of muscle. Histologically, the bone was dense, well-formed, and lamellar; it clearly involved the connective tissue septa of the muscle and between these trabeculae it isolated bundles of viable but altered fibers (Fig. 6).

This is a parosteal form of myositis ossificans, though the greater component was extra-osseous and illustrates primarily the involvement of connective tissue septa.

FIG. 6

(Case 6) Photomicrograph of a lesion excised from the quadratus femoris muscle 7 months after injury. Large fasciculi of altered but viable muscle are isolated by mature lamellar bone plates which have formed along the septa.

In some instances the formation of cartilage appears to be the initial or the predominant change. Although this cannot be readily explained, quite possibly the same causes are operative here as in a healing fracture.

Case 13. A 21 year old negro man was struck on the anterior surface of his right arm during a fight. His arm became swollen and tender. Three weeks later a firm movable mass was palpable in the brachialis anticus muscle.

A roentgenogram revealed a discrete, finely calcified mass in the belly of the muscle, which was excised without difficulty. It was a roughly spherical mass 2.5 cm. in diameter. On section it was found to be composed of lobules of glistening cartilage with soft bone interspersed. Histologically, mature, heavily calcified cartilage predominated, but enchondral and intramembranous bone was also present (Fig. 7).

The development of this lesion was unusually rapid, and in all probability it would have consisted almost entirely of bone within a relatively short time. We are unable to determine whether there is a racial difference in the rate of progression of this process.

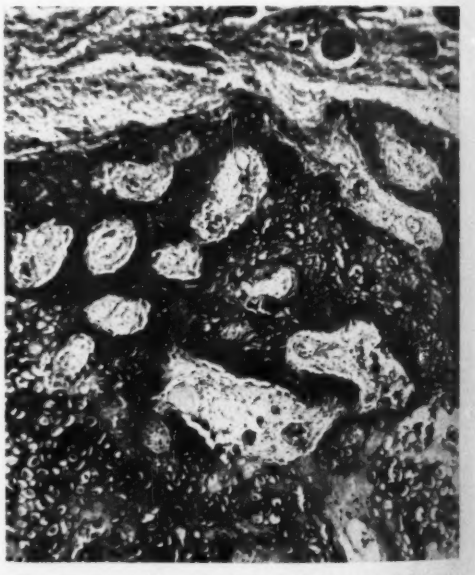
Periosteal Lesions

Just as the lesion which arises within muscle independently of bone has been referred to as an osteoma, so the older literature frequently refers to ossifying subperiosteal hematomas. Although some of the reported cases will not bear careful scrutiny, there can be no doubt that a lesion does exist which is the result of trauma to the periosteum. It is clear that any process which produces a hematoma beneath the periosteum, or which so damages the periosteum that hyperemia and edema elevate it to any degree, will lead to the formation of bone. Ackerman[8] in his recent study discusses such a lesion involving the distal radius. Jaffe[9] applies the term "periostoma" to such lesions. So-called greenstick fractures in children also illustrate this phenomenon.

In acute cases the periosteal reaction frequently simulates an infection or a malignant tumor. At times a stress fracture is not recognized and later may be obscured by this reaction. Trauma incident to surgery may produce just such a process (Fig. 5).

Phasic or intermittent elevation will produce a lamination of periosteal bone; more abrupt changes will produce the pattern of radiating spicules or a totally irregular appearance roentgenographically. As the lesion

FIG. 7



(Case 13) Photomicrograph of the periphery of a lesion removed from the brachialis anticus muscle 3 weeks after injury. Newly formed woven bone is seen in the upper portion of the illustration, and cartilage below. Bone formation is proceeding by enchondral ossification.

evolves, provided there is no continued stimulus, there is rapid osteoclastic and osteoblastic activity, and it is to be expected in most cases that with eventual quiescence and remodeling, the contour of the bone may become normal or nearly so. However, this is not invariably the case.

Case 15. Two years ago a 21 year old white woman had noticed a small mass over the right eighth rib in the anterior axillary line. Fourteen months later this mass was excised elsewhere and diagnosed as osteomyelitis. (The tissue sections were not available to us.) One month ago pain appeared in this area.

There was a firm fixed nodule over the seventh rib in the anterior axillary line. Roentgenograms revealed a questionable destructive process with new bone formation about it. The lesion was excised. There was a fusiform enlargement of the rib of 2 by 1 by 1.5 cm. in size. The lesion overlying the rib was easily cut, but the rib was denser than usual. Histologically, there was abundant extracortical subperiosteal bone and cartilage formation in cellular mesenchyme and fibrous tissue (Fig. 8). The cortex and cancellous trabeculae were thickened and the marrow spaces filled with fibrous tissue.

The etiology here is obscure. Although there was no history of trauma, the second lesion was felt clinically and roentgenographically to be a fracture. It is not uncommon for fracture of a rib to go unrecognized, and it is possible that some associated process or occupational stress produced repeated, unrecognized trauma to this area.

FIG. 8

(Case 15) Transverse section of a portion of the resected rib. The original cortex is seen below. There is marked subperiosteal proliferation of bone and cartilage.

Parosteal Lesions

Parosteal myositis ossificans is the form most often seen. That which so often occurs in the brachialis anticus muscle following fracture dislocation of the elbow is a well known example. In severe cases of this type the joint may be completely bridged by new bone attached to the coronoid process of the ulna and to the shaft of the humerus. Usually, those which develop against the shaft of a long bone do not present a formidable diagnostic problem. The classic dotted-veil effect, so often described, is seen in roentgenograms taken during the early stages of these lesions.

There are a number of lesions properly falling in this category, however, which are extraordinarily difficult to diagnose. This problem results from the immediate proximity or actual involvement of bone, which makes the interpretation of roentgenograms difficult. This is especially true when the lesion is active.

Johnson[4] has discussed these lesions, and has presented a reasonable though somewhat idealized account of the pathogenesis. Aside from the location of the lesion, the complexity is attributed to the fact that all of the connective tissues previously mentioned may participate. Thus, the histogenesis in some instances is that of the extra-osseous form with secondary involvement of underlying bone. In others the periosteum is torn and thus actively participates. In still other cases the process may occur entirely within tendinous attachments to bone, and thus differ almost completely in mode of development.

In the majority of cases trauma is so directed as to crush a large mass of muscle directly against the shaft of a long bone or perhaps against the vertebral column. In these cases the damaged area is seen to be hemispherical rather than spherical. The same processes of muscle regeneration and connective tissue proliferation which we have just discussed follow. This again may be oriented from the periphery, the zone of least damage, with activity persisting in the central portion.

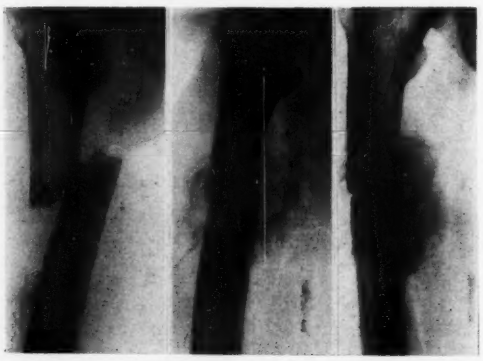
As this type of lesion develops, it will appear to arise superficially from bone by virtue of lying directly against it. The shell of bone, which is the most mature portion forming peripherally, seems to merge and blend with the cortex of the adjacent bone. With increas-

ing vascularity and direct pressure developing as this lesion matures and expands, there ensues a variable degree of resorption of bone beneath the lesion in such manner that the appearance of arising from bone may be extraordinarily emphasized. Of course, it is difficult to differentiate this type of lesion from those in which there is associated periosteal damage at the time of injury. In these latter cases the previously described periosteal reactions become incorporated within the process, and are indeed more exuberant than those which occur entirely beneath the periosteum. Thereby an even more substantial and direct continuity with bone is established. At times this lesion has been referred to as subperiosteal giant cell tumor, and at others as ossifying subperiosteal hematoma; unquestionably, certain examples of aneurysmal bone cyst also represent this process.

It is quite evident that when there is concurrent damage to all of these tissues, muscle, periosteum and fascia to wit, the process is a much more florid and disturbing one than is seen in the other instances, especially where only one tissue is concerned. This is well illustrated in the case of a fracture which was associated with extensive soft tissue trauma, and which posed a diagnostic problem.

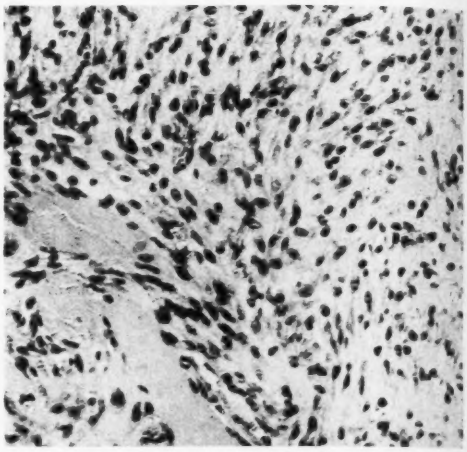
Case 14. A 66 year old negro woman had a fracture of the upper shaft of the right femur in a severe fall. After one week of balanced traction a Küntscher nail was inserted. Grayish fibrous tissue about the site of the fracture and extending into muscle was removed and sent to the laboratory. A diagnosis of "sarcoma, unclassified" was returned. A review of the roentgenograms at that time (Fig. 9) disclosed a large, ill-defined, faintly calcified soft tissue mass surrounding the fracture site where there was some resorption of bone. This was reinterpreted as possibly representing a destructive lesion within the shaft of the femur. Upon the request that the case be reviewed, one of us proposed a diagnosis of myositis ossificans after consultation with the radiologist. Histologically, this tissue was quite heterogeneous. There were large sheets of very active fibroblastic cells (Fig. 10), in some areas of which bone was forming; in other areas there was an intense regeneration of skeletal muscle producing many pseudo-giant cells (Fig. 11). Elsewhere there

FIG. 9



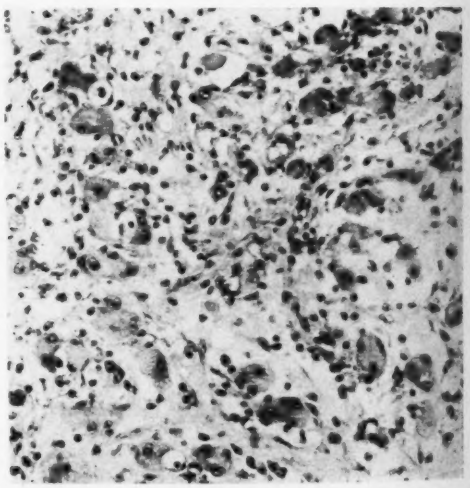
(Case 14) Serial roentgenograms of a fracture of the upper third of the femur. The tissue which was interpreted as sarcoma was removed at operation 8 days after the original roentgenogram seen in the left panel. The roentgenogram in the center panel was taken 2 weeks later because of the problem posed by the biopsy diagnosis. The rarefaction adjacent to the fracture was interpreted as possibly representing a malignant process. Note the abundant callus.

FIG. 10



(Case 14) Photomicrograph of a highly cellular area which was interpreted as sarcoma. Degenerate muscle fibers are seen in the lower left.

FIG. 11



(Case 14) Photomicrograph of regenerating muscle fibers and proliferating endomysial cells.

were large blood-filled lakes, which were partially surrounded by these giant cells in some instances. The subsequent course of this patient has been uneventful.

In retrospect little reason can be seen for the maze of confusion which existed in this case. However, appreciating the misinterpretation of these fundamental tissue reactions during the evolution of the lesion, it is easy to see the manner in which the diagnostic impressions led rather far afield.

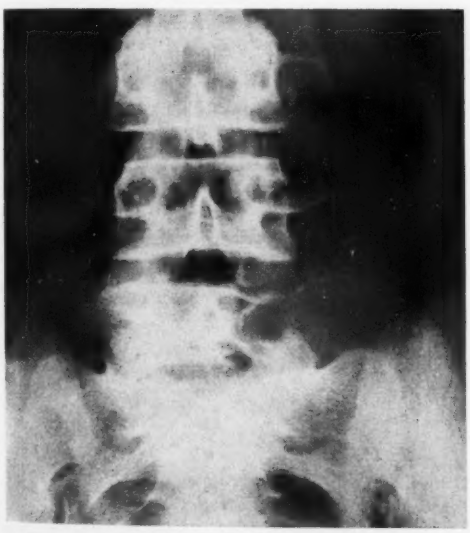
This illustrates both the complexity and the intensity of these reparative processes in which fibrosarcoma and osteogenic sarcoma are so closely simulated. Most of the lesions are fortunately at a more advanced stage when they are first available for study.

These lesions have been diagnosed at times as ossifying subperiosteal hematomas or subperiosteal giant cell tumors. It is interesting to note that occasionally they may simulate or actually reproduce the roentgenographic and clinical picture of aneurysmal bone cyst.

Case 12. A 14 year old white girl was seen 3 months after she forcefully struck her back against a waist-high wall. For 2 months she had had low back pain radiating into the left leg. The roentgenograms taken 3 weeks after the injury were not available. She had lost 14 pounds.

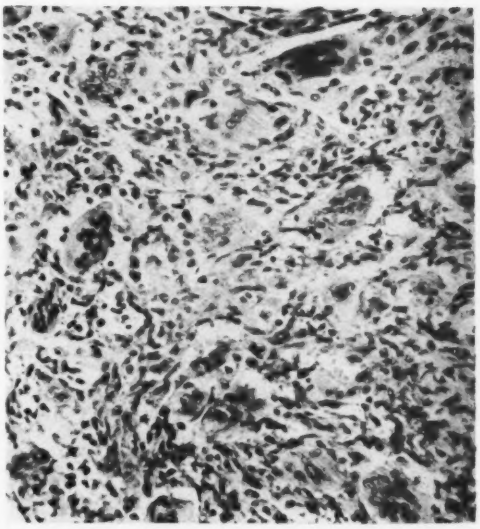
There was some limitation of motion of the spine in all directions. No neurological changes were discovered. Roentgenograms (Fig. 12) revealed a circumscribed paravertebral soft tissue mass with flecks of calcium. The lateral one-fourth of the body of L-5 and the lamina and pedicle of this vertebra were destroyed.

FIG. 12



(Case 12) Roentgenogram taken 3 months after injury to the back. There is a well defined soft tissue mass with flecks of calcium at the level of L-4 and L-5. The lateral part of the vertebral body, the pedicles and transverse process of L-5 are destroyed. This was interpreted as a soft tissue malignancy or an aneurysmal bone cyst.

FIG. 13

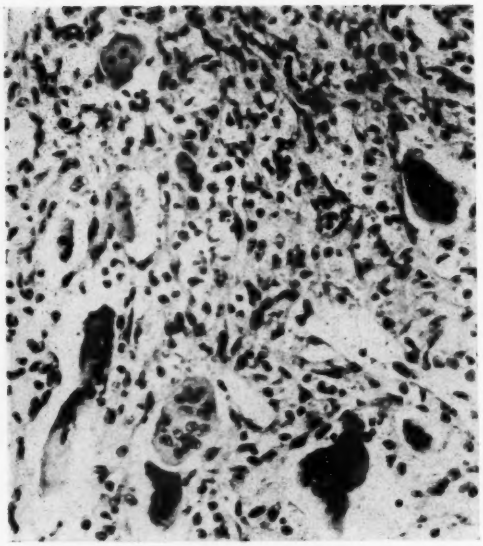


(Case 12) Photomicrograph of an area near the center of the lesion in the vicinity of a large blood-filled space. The resemblance to giant cell tumor of bone is striking.

An aspiration biopsy and local excision of the lesion were performed. A well-encapsulated, oval mass of 7 by 5 by 4 cm. was excised intact. A broad stalk extended into the body of L-5 from this mass, which had a thick capsule containing thin plates of bone and large blood-filled spaces in the central portion, although it was primarily a solid mass. Histologically, this was a polymorphous lesion. In the central portion about the large blood-filled spaces were numerous multinucleated giant cells, some of which were demonstrated to be regenerating muscle fibers (Fig. 13). Intact muscle fibers were identified in the more fibrous areas of the lesion (Fig. 14). The bone in the capsule was entirely new woven bone. Serial roentgenograms following operation showed a well-circumscribed bony mass forming in the area from which the lesion had been excised (Fig. 15).

This case is of extraordinary interest since roentgenographically it appeared to be a classical aneurysmal bone cyst, and histologically corresponded exactly with the lesion which has been termed subperiosteal giant cell tumor. If this lesion had been excised piecemeal, rather than as an organic whole, it is our impression that recurrence would have been a much more diffuse and perhaps a progressive process since the osteogenic tissues would have been thereby disseminated

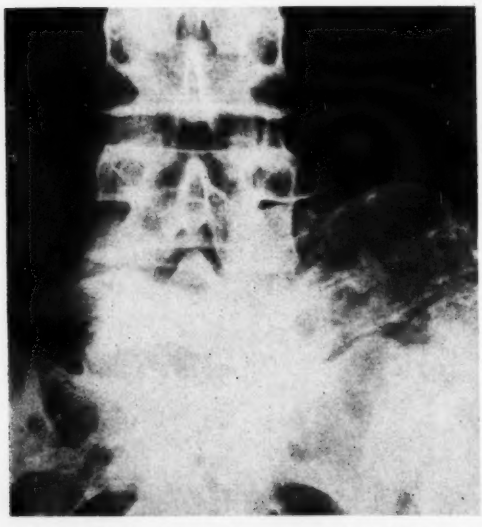
FIG. 14



(Case 12) Photomicrographs of a grossly fibrous area removed at some distance from that seen in figure 6. Isolated viable and degenerated muscle fibers are seen.

throughout the adjacent muscle and fascial planes. The fact that this particular lesion recurred, thus following the usual sequence of events in the parosteal type of myositis ossificans, may be considered as important adjunctive evidence for its diagnosis. This is of great importance in the treatment of those lesions in this location.

FIG. 15



(Case 12) Roentgenogram taken one year after that seen in figure 12, and after excision of the lesion. The lesion recurred in the site of the previously excised lesion. The resemblance to an aneurysmal bone cyst is remarkable.

Case 2. A 22 year old white man had noted for 4 years the onset of a tumor on the anterior aspect of his left thigh, which had followed an injury. He related that during that time the mass had gradually increased in size.

An elongated firm tumor was palpable in the soft tissue of the anterior thigh and extending from the upper third to just above the knee. The mass was thought to be freely movable. Roentgenograms (Fig. 16) disclosed a fusiform bony mass arising in the midportion of the shaft of the femur. This was dense, and the periosteum was obviously incorporated in the lesion. Several spikes or spurs projected inferiorly into the soft tissues.

At operation this firm bony mass was found to be adherent to the cortex of the femur and was removed by osteotome. The material removed was an elongated mass of firm, well-organized bone. This impression was confirmed histologically. During the following 6 months the lesion gradually recurred in the same site, but extending over a somewhat larger area (Fig. 17).

FIG. 16

(Case 2) Roentgenogram showing a bony mass closely applied to the shaft of the femur, 4 years after injury.

FIG. 17

(Case 2) Roentgenogram of the femur 6 months after excision of the lesion seen in figure 16. This lesion recurred in the site of the previously removed lesion.

However, in the ensuing 4 years there was gradual resorption of the lesion, and there remained finally only moderate thickening of the cortex in the middle third of the femur.

It will be noted that this lesion recurred quite rapidly, and in the precise site of the previous lesion. That is to say, it did not grow outward from the bone but simultaneously recurred in all areas from which the previous lesion was excised.

In some cases these lesions are of considerable duration. It may be presumed that this results from continued trauma to the initiated lesion.

Case 9. An 11 year old white boy had, for about 2 years, noted a swelling over his right tibia, which had been traumatized on numerous occasions. Two weeks prior to admission he had received a severe blow there, which had caused great pain to the area and some increase in swelling.

On examination there was an extremely tender swelling over the anterolateral aspect of the tibia just below the joint. Although it was firm and warm, there was no overlying venous engorgement. Roentgenograms (Fig. 18) revealed a large irregular calcific mass, almost entirely extracortical, and having a number of feathery prongs or fronds extending from its periphery. It had a peculiar appearance. There was an intense periosteal reaction, old and static, adjacent to the lesion, and a moderate degree of resorption of bone beneath the lesion.

An above-the-knee amputation was performed elsewhere; a gross description of the specimen is not available. Histologically, this lesion was a heterogeneous mixture of mature and immature cartilage and bone with areas of well-organized and highly cellular fibrous tissue. Bone was forming by both direct or membranous formation and enchondral bone formation. Although a zonal pattern was not discernible in the tissue sections, it was distinct in the roentgenograms of the lesion.

Unfortunately, histologic study was not completely satisfactory in this case, because no section of the entire lesion was available for study. However, there was apparent here a conglomeration of mature and immature cartilage and bone, and in the roentgenograms there was distinct evidence of a long-standing periosteal reaction secondary to a lesion which was largely extracortical in location.

Certain exostoses along the shafts of bone may represent a form of myositis ossificans, the development of which is explained by crushing injury with tearing of the periosteum. Periosteal and fascial bone formation combine to form a stalk. The constant gliding of muscle over this polishes the surface where fibrocartilage, and rarely hyaline cartilage, form.

There are instances of exostoses, however, which form in quite a different fashion and involve tendons at the point of attachment to long bones. The trauma in these instances is of a more chronic or sustained type in which constant tension is applied to the attachment. This is the type of trauma which to a great extent is not realized. One observes here not so much a cellular proliferation within the tendon, as a mucinous alteration within the matrix of this substance, which gradually as-

FIG. 18

(Case 9) Roentgenogram of a lesion involving the proximal tibial metaphysis and diaphysis. In the resected specimen it is seen that the lesion is principally extracortical and consists largely of periosteal bone. Involvement of underlying bone was a secondary process.

sumes a chondroid character. Cartilage subsequently forms in excess of the minimal amount frequently seen in a tendon near its

FIG. 19

(Case 20) Roentgenogram showing a sessile bony mass on the posterior femur in the region of the linea aspera. Fibers of the gluteus maximus inserted into this lesion.

attachment. Concurrently excessive osteoblastic activity is apparent on the inner surface of the bone beneath this tendon. There may, therefore, be a simultaneous process of en-

FIG. 20

(Case 20) Photomicrograph of the surface of the lesion seen in figure 19. Fibers of the gluteus maximus tendon insert into this area. There is an excessive amount of cartilage over the bone, and fairly prominent osteoblastic activity immediately adjacent.

chondral ossification forming bone upon the surface and appositional bone growing beneath the surface. This lesion must by its very nature form in continuity with the cortex of the bone; such lesions grow by accretion, and there is continuous reconstitution of the deeper portion, which blends with the medullary canal.

Case 20. A 53 year old white woman had noticed a dull discomfort in the left hip for 6 months, especially after sitting for a considerable time.

Physical examination was not contributory, except that the pain was found to be localized precisely on the posterior aspect of the upper femur just inferior to the intertrochanteric line. Roentgenograms (Fig. 19) revealed a localized, somewhat lobular proliferation of bone on the posterior shaft of the femur in the region of the linea aspera. A mass of mature, well-organized bone of 3.5 by 2 by 1 cm. was removed from the posterior femoral shaft in this area. The lower fibers of the gluteus maximus inserted into the lesion. Histologically, this was mature, well-organized bone, the surface of which was covered by a rather poorly formed hyaline cartilage. Tendon fibers interdigitated with this cartilage and bone. There was some mucinous change within the tendon immediately adjacent to areas of cartilage formation (Fig. 20).

Summary

A comprehensive definition and classification of myositis ossificans based upon an analysis of 23 cases of localized heterotropic bone formation has been proposed. We define it as the total of all soft somatic tissue reactions which follow trauma and which may progress to the formation of bone or cartilage. The definition includes the process, that is, the tissue reactions preceding and associated with bone formation, as well as the end product. The classification is designed to emphasize the various locations in which the lesions may be found, specifically extra-osseous, parosteal, and periosteal.

A recapitulation of the pathogenesis of the various types of myositis ossificans is presented, emphasizing the reaction of the various tissues which may be involved. The possibility of, and reasons for errors in diagnosis are stressed, and salient diagnostic features are stipulated.

It is recognized that myositis ossificans is an unsatisfactory term in certain respects. We have chosen to use it, however, because the implications of such a diagnosis are generally understood, and because any completely satisfactory designation is of necessity so cumbersome as to be unsuitable for ordinary communication.

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Discussion (Abstract)

Dr. Mary S. Sherman, New Orleans, La. So much is covered in this thoughtful paper that it is difficult to discuss at all, let alone in a few minutes.

I believe that the authors have done a real service in focusing attention on the fact that the process of normal ossification is the same wherever it is found. The importance of understanding and recognizing this process is amply demonstrated by the horrible examples cited in the presentation. In this connection I should like to underline the authors' convictions that it is imperative, when undertaking the interpretation of a bone lesion, to correlate the history, the clinical examination, and the roentgenogram with the pathologic examination.

I am not so sure of the wisdom of using the term myositis ossificans for all heterotopic ossification in soft tissue. Although it is good to understand that ossification in a degenerating tendon and ossification in a major muscle are the same basic process, the clinical manifestations are so different that it still seems to me useful to separate them. What alarms the doctor about the patient with classic myositis ossificans is that the mass evolves rapidly, often without sufficient trauma to provide significant muscle damage, and that it is firm, hot, and tender. The other examples of ossification cited here, the stimulus for which may well be something else than trauma, do not explode in this fashion. I am excepting the case of the vertebral lesion, which seems to me not to belong in this group.

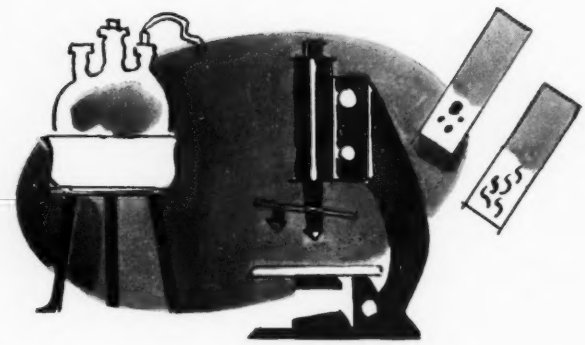
I would really prefer to have the authors use as title part of their definition of the title: ". . . reactions of soft somatic tissue which may progress to the formation of bone and cartilage," and to continue to consider myositis ossificans as one example of these reactions.

Dr. Gilmer (Closing). It is gratifying to have so

great a measure of support from Dr. Sherman. I am sure that the orthopedists have a greater appreciation of the problems posed by many of these lesions than most physicians, and, therefore, a greater respect for them.

Dr. Sherman's criticisms were anticipated in part. With regard to the paravertebral lesion it would be, I believe, perfectly proper to call this an aneurysmal bone cyst, but it should be specified that in this particular case, unlike those previously reported, the etiology has been established and it is a form of myositis ossificans.

The suggestion that the title be altered and a portion of the definition used instead is an apt one and deserves serious consideration. This goes directly to the core of our thesis. It was our belief that for practical purposes it was best to broaden the scope of a well-established and widely understood term, rather than to introduce a new one. An editor might think differently.



The Nostalgia Syndrome: With a Reference to Its Occurrence in the Union Army in the Civil War*

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LESLIE B. HOHMAN, M.D.,† *Durham, N. C.*

The authors consider the part nostalgia may play in psychiatric disorders, especially in those of a reactive-depression type. This is a factor to which little attention has been given.

MILITARY PSYCHIATRY has a brief history and only in the last three major wars has any attention been paid to the psychiatric casualty. However, inspection of the records of casualties in previous wars affords us an occasional glimpse of some of the psychiatric problems faced by medical men in those wars. Of particular interest in the Civil War was the disease entity called "nostalgia." Five thousand, two hundred and thirteen men were discharged from the Union Army with this diagnosis, and 58 deaths were attributed to the disease.[1] In the discussion of the various diseases of the central nervous system this entity alone was considered worthy of comment in the *Medical and Surgical History of the War of the Rebellion*.[2]

The symptoms of nostalgia were graphically described by Surgeon John L. Taylor of the 3rd Mo. Calvary as follows.[3]

"In many instances the symptoms of hypochondriasis were present: Disordered digestion; increased sensibility; palpitation; illusions; a succession of morbid feelings which appeared to simulate the greater part of disease; panics; exaggerated uneasiness of various kinds, chiefly in what regards the health, which they stubbornly contended was seriously injured and could not be restored short of being at home. There was a stubborn indolence in these patients—an aversion to anything like even ordinary exercises. They were generally found lying in bed or sitting around the tents, making a great deal about their sufferings and the ills that were awaiting them. Kind and sympathizing words—amusements—seemed to invite a more deplorable condition."

It was further apparent from the statement of Surgeon Madison Reese of the 118th Illinois Infantry, "in one case the disease amounted to mania,"[4] that although the symptoms described were for the most part reactive affective disorders, they were also on some occasions part of a manic depressive illness.

The conflicts aroused by homesickness, however, are not limited to the military environment. They frequently precipitate or complicate the therapy of similar affective disorders in civilian life. The following 5 cases serve to illustrate this point. The cases to be reported were all men and the symptomatology was in all instances characterized by pervasive affective disturbances. These patients were seen in Duke Hospital and the V. A. Hospital, Durham, North Carolina, and the John Sealy Hospital, Galveston, Texas.

Case 1. W. H. J., was first seen on the Psychiatric Service on Mar. 26, 1953, when he was brought to the emergency room after having threatened suicide. There was a history of previous episodes of depression and elation.

At the time of his first admission in 1953, he was 50 years old and had recently moved to North Carolina to take on a job for the engineering firm for which he had been working. This represented a promotion, but it also offered him an opportunity to return to his native state. He developed typical symptoms of feelings of unworthiness, thought he might lose his position, thought he was disrupting the family, became sleepless, had poor appetite, and lost weight. He also had attacks of anxiety with palpitation, feelings of exhaustion, and fear that he had damaged his heart. He spoke of specific suicidal intent and even considered taking his youngest child, a daughter of 10, with him in his suicide to spare her the shame of his failure. This depression was apparently precipitated by his intense homesickness for his job in the North, and even after he recovered he tried to work out a scheme by which he could return to his old work in the North.

In 1938, when the patient was 35, he had given up his position as professor of chemistry in one of the prominent agricultural schools and had taken the job

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with an engineering company. At this time he also went into a depression which lasted a number of months.

The patient's depression yielded after 6 weeks of treatment with electroshock, but 7 months later he again became depressed, still yearning to return to his previous work. He was again treated with electroshock, cleared up completely, and then moved back to the North.

Comment. There is some evidence that the two changes which had precipitated the depression finally may have been made while the patient was in an elated mood. There was a strong constitutional element toward depression in this case. A maternal aunt had a "nervous breakdown," and a maternal uncle committed suicide.

The striking thing about the case was that even after recovery the patient's homesickness persisted and resulted in his return to his job in a northern city.

Case 2. E. A. M., a 58 year old white theological seminary professor, entered this hospital with a chief complaint of depression of 3 years duration.

The patient's symptoms had started 6 months after his transfer from a midwestern seminary to a southern seminary, in the fall of 1953. This transfer had been precipitated by a change in the administration of the institution where he had spent 20 years as a teacher. During his first 6 months in his new position he was elated about the "challenge" of his new work, but suddenly he became "melancholy" and began to find fault with everything, comparing everything in both his work and home to "back there." On frequent occasions the patient considered transferring back to his old position.

In November of 1955, he was treated with 8 electroshock treatments and was improved for 8 months, but subsequently relapsed and was finally so depressed and felt so guilty that he had to give up his teaching. He was admitted to the hospital in January of 1957, at which time he was complaining of "melancholy feelings." He appeared depressed, cried frequently, felt guilty, particularly concerning the purchase of his new home, having left "my good job, and my lack of faith." He described all of the biologic concomitants of depression. The patient was subsequently given 15 electroshock treatments, again with only partial relief of symptoms. His course was then followed as an outpatient for 3 months when, after a trip to give a talk in a distant town, the patient described his recovery during the airplane trip as "my spirits lifted and I knew I was well." He has remained asymptomatic.

Comment. It is interesting to note that at the age of 25 the patient had a period of "poor health" following his transfer to a new pastorate. His wife and the patient both deny, however, that he was depressed at that time.

After his recovery the patient described the intense longing he had for the old familiar routine and surroundings of his previous employment and home. He frequently used the word "homesick" to describe these feelings.

Case 3. H. H. W., a 63 year old, white, married man, related a history of 20 years of mood swings, particularly of a depressive nature but characterized by hyperactivity, excessive talking, poor sleep, easy fatigability, crying spells, and numerous somatic complaints.

In 1947, the patient was treated with electroshock at the University of Virginia Hospital, but left after 3 treatments because he was improved and was "homesick." He relapsed and was later treated in Richmond, Va., with 10 such treatments when he recovered. This was the first major depressive episode and was characterized by extreme psychomotor retardation, numerous delusions incidental to affect (self accusatory), and an exacerbation of all the symptoms characteristic of his usual milder mood swings, with the exception of his talkativeness.

He did well then until 1956, when his mood swings became more severe, culminating in a second major depressive episode which began in May of 1957, at which time he had marked psychomotor retardation, severe hypochondriacal imaginations, insomnia, anorexia, weight loss, easy fatigability, crying spells, loss of energy and interest and suicidal thoughts. The patient was given 8 electroshock treatments following which marked improvement was noted. The patient, however, said he was quite "homesick" and insisted on going home. He was allowed to go home but returned 2 months later, in September, again quite depressed. A second series of 8 treatments were given, again resulting in improvement, "homesickness," and insistance on discharge from the hospital.

Finally, the patient returned in January of 1958, quite depressed. On this occasion he was given 12 electroshock treatments with recovery. In discussing his recurrent homesickness the patient stated "Doctor, I have never felt well in my life away from home. The longest I could stay away was 2 or 3 days at a time." Since his last series of treatments the patient has continued to have mood swings of only moderate intensity.

Case 4. C. W. L., a 22 year old white, separated man, was well until Dec. 19, 1954, when he was placed on guard duty at an Air Force prison. Several prisoners planned and executed an escape during which one of the prisoners was shot and killed.

On his furlough home at Christmas his parents noted he was restless, tended to tell exaggerated tales and was irritable. He slept little and talked excessively while at home. He returned to duty and then began to write letters to his family which described in grandiose terms his activities with the Air Force Intelligence Branch. At this time, however, the patient was complaining of tension, anxiety and restlessness. He subsequently represented himself to a genuine Air Force Intelligence officer as having duties in the Air Force Intelligence. He was immediately hospitalized and discharged from service as having an immature personality.

On his return home in February of 1956, the patient

was irritable, restless, at times depressed but hyperactive, telling grandiose tales to all who would listen. After working for a short period of 8 to 10 weeks for his father, the patient took a job as a drummer in a "rock and roll" band. He worked at this for the next 9 months, during which time he married an extremely immature (chronologically and personality wise) girl. This marriage lasted until January of 1957, when he separated from his wife. The patient fractured his back in January of 1957, and recovered without sequelae. His psychiatric symptoms, however, continued unabated until one week prior to admission when he struck his girl friend in a minor argument. He was admitted to the hospital where he appeared depressed but was restless, talkative, and told grandiose tales about his Army service and work with the "rock and roll" band. All of these, however, contained some essence of truth. His statement on mood was that he felt "blue," and he cried frequently. The patient was subsequently observed to be irritable, but to show a hypomanic-like hyperactivity.

He was diagnosed as having a manic depressive reaction-mixed type, and was given a course of 8 electroshock treatments which resulted in severe anxiety about the treatment but was a recovery from his previous symptoms. The patient was then allowed to assist in one of the hospital laboratories as it was his intention to become a laboratory technician. However, he became quite homesick (nostalgic) during this period and, although he wished to continue in the laboratory, he repeatedly requested that he be allowed home on passes and leaves. Finally, since he appeared quite depressed, he was allowed a trial leave at home where his symptoms promptly subsided. The patient was subsequently discharged after he stated, "Doctor, I am so homesick I can hardly stand it." The patient was seen 6 weeks later and was asymptomatic.

Case 5. R. T., a 20 year old white, single man, presented himself to the hospital with the chief complaint of "running around," drinking too much, and involuntary protrusion of his tongue.

Three years prior to admission the patient's family moved to Texas from Arkansas. Following this move the patient attended school in Texas, but was so homesick because of his lack of familiarity with the town, the people, and the new environment that he became quite tense, anxious and restless. Because of these symptoms he returned to his original home in Arkansas where he felt well and was able to finish high school with good grades. He was asymptomatic until he enlisted in the Air Force in the fall of 1956. In a few weeks he became afraid of being unable to carry out his military duties and was frightened by the discipline in the Air Force. He became tense, anxious, had insomnia and claustrophobia. He was seen by a psychiatrist who felt that he was unfit for military duty and he was discharged from the Air Force. He was upset about being discharged and so ashamed of his failure that he refused to go home, living off of savings he had accumulated. He returned home after his savings had been dissipated.

When he returned to his home it was noted by the parents that he was an entirely different person, he was retarded, had no energy, no interests and no plans for the future. He did, however, go to college in the fall of 1957 planning to be a radio announcer, but was unable to concentrate and dropped out after Christmas of 1957. He consulted a psychiatrist and was sent to the hospital for 2 weeks. At this time his tongue was involuntarily protruding from his mouth. He was given 8 electroshock treatments as an inpatient with several more on an outpatient basis following his discharge from the hospital. He improved and remained well until June, 1958, when he had a recurrence of his symptoms.

The patient's past history was relatively noncontributory. He had never presented a disciplinary problem. There is no family history of nervous or mental disease.

Examination revealed a tense, young man whose facial expression was that of extreme agitation and anxiety. He constantly reiterated that he would feel fine if he were just allowed to go home and "get out of here." His statement of mood was that he felt "downhearted" and he listed all the biologic concomitants of depression, with particular emphasis on symptoms of anxiety. On several occasions the patient blamed all his difficulty on "homesickness," stating that he had always liked to be around home and around people whom he knew and in an environment which was familiar to him. He ascribed some of his difficulties in the service to homesickness.

In spite of further shock therapy the patient remains in the hospital at this writing.

Discussion

It is apparent that the cases reported here illustrate how homesickness may play a different role in cases of affective disorder. In cases 1, 2 and 5, homesickness was a critical factor in the precipitation of the patient's illness. In cases 1 and 2, the patients had moved with their wives and children, and in case 5 with his parents to new environments, yet the homesickness occurred. It would seem clear that it was not the loss of support of members of their families, but the actual physical environment and other persons in the environment that accounted for the homesickness. This was graphically illustrated in the case of E.A.M. who constantly complained about his new home and compared it to his old home. In case 3, however, the patient's dependency on his wife was almost equal to his desire to be in a familiar environment. This case was interesting as well in that when the patient was profoundly depressed, homesickness was no problem. Only when improvement took place did the patient's homesickness become obvious. Finally, case 4 demonstrates how homesickness occurs following recovery from an illness. In this instance, there was no real evidence to suggest that homesickness had been a prob-

lem in the patient's life prior to recovery from his illness, since both the patient and his parents denied its existence. We were at first inclined to consider its existence as evidence of persistent psychologic symptomatology. However, the prompt remission of the symptoms on returning home and their reappearance on re-entering the hospital for observation was evidence that the symptoms were situationally determined.

Although the disorder of nostalgia as described in the records of the Civil War was a frequent occurrence, with the exception of Menninger's comments[5] little mention is made of this disorder in modern textbooks of Military Psychiatry.[6-8] That it did occur frequently in World Wars I and II is borne out by the personal experience of one of us (L.B.H.) who had the opportunity of observing many such cases. A typical case not infrequently observed in the Navy was a married man, age 26 or 27, with several children, who was regarded as the ideal husband, a hard worker, who turned over his earnings to his wife and lived almost exclusively in the aura of his family life. A number of these men could not bear the separation from wife and children, would be extremely depressed and downhearted, weeping most of the time. They would be sent to a discharge board and as soon as they were informed that within a reasonable length of time their discharge papers would come through, their "nostalgic reaction" would disappear. However, as is illustrated in case 5, other conflicts may arise which tend to perpetuate the illness even after discharge from the service.

The infrequent occurrence of homesickness and "nostalgia" in civilian life in contrast to the frequent occurrence in the military is probably related to several factors. First, the frequency of occurrence of moving to a new environment is greater in the military, because entering military service is always associated with a move to a new and different environment. Second, in making a move in civilian life elaborate preparations are required, particularly if the patient moves his family or moves with his parents. The home selected is often similar to that from which he moved and the furnishings are familiar. Furthermore the contrast in any 2 towns is not as great as the contrast between "home" and the spartan simplicity of the military environment. Third, the military places far more demands on the individual for orderliness and punctuality than are commonly encountered in civilian life. Fourth, the support of friends and family are lacking, and opportunities for contacts with the opposite sex are, in the early phases of military training, nonexistent. Fifth, the usual location of the military camp in a rural area far from the frequented recreational areas of civilian life, as well as long periods of idleness contribute to the development of homesickness.

There are obviously many other more subtle factors responsible for the frequent development of homesickness in the military; however, we believe that the ones enumerated are probably of primary importance.

Conclusions

Five cases of affective disorder precipitated by, or complicated by homesickness are presented. The various factors responsible for the apparent difference in the frequency of occurrence in military and in civilian life are discussed.

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Discussion (Abstract)

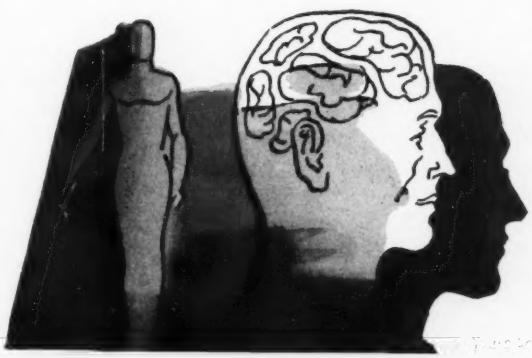
Dr. Charles Watkins, New Orleans, La. It is a pleasure to have the opportunity to discuss this very excellent paper by Drs. Hohman and Wilson. I must say that the experience has aroused nostalgic feelings to some degree within me. I shared with Dr. Wilson the privilege of having worked with Dr. Hohman, and the thoughts that are being expressed in this paper are ones with which I am in hearty accord. Too often is the problem of depression neglected in our current psychiatric literature.

It is indeed interesting to have the opportunity to hear Dr. Wilson tell us something of the psychiatric problems of the Civil War. I am particularly interested in the fact that the Confederate Army apparently had little or no psychiatric illness. This is certainly an interesting observation and it would make one wonder as to a possible explanation for this. I feel certain that it is not due to the fact that there was markedly more inadequate recognition of the disorder in the Confederacy than there was in the Union Army.

Again it is interesting to listen to the description of the symptomatology which is so like that which we now see quite frequently among our recruits in the peace-time service, and particularly in many instances among the dependents of military personnel.

I would certainly agree with Dr. Hohman that this sort of symptomatology was not unique during World War II and I would also agree with him that it was more likely to occur in the type of personnel whom he described, that is, someone who has, as a rule, adjusted well in situations where constant achievement and accomplishment were possible but who, in the necessary regimentation and frequent inactivity of the military, was likely to become depressed in periods of relative calm. This I think is not unlike the situation that we see so frequently in civilian life where an individual functioning well in a job begins to develop a depressive reaction, feeling of isolation and feeling that things were much better in the past. This syndrome as a rule appears to be associated, at least in my experience, with the depressive type individual who functions well in new situations where he is able to constantly see the results of his activities while a job is being established and while a task is being accomplished. Once the work is well established there is no reassurance from stability itself and then these individuals frequently become depressed, and anxious about their own accomplishments, look back to the past when things were better; as a rule this means when things were still being built up, when the future was the main preoccupation rather than the present. They turn to thoughts of the future in the hope that the situation can be improved by another job. This frequently does happen temporarily when a new job is taken on because the individual does escape from his own psychologic difficulties into the reality of the work situation and has little time to think of other things for a period of time.

I hope that we have an opportunity to hear more from Dr. Hohman and Dr. Wilson about this very important subject. It is one that is certainly quite common in the general psychiatric practice and is one that has much too little written about it.



An Evaluation of Nursing Homes in a Suburban Community*

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Nursing homes, their number and their adequacy to meet the domiciliary and medical needs of the patients, present a pressing problem in every community of the nation. Studies such as this offer basic information of aid in planning and supervision.

The Need for a Study

IN RECENT YEARS there has been an increasing effort to understand the institution known as a nursing home. Reports both favorable and unfavorable have been forthcoming. The fact remains, however, that little is known about this type of institution and the problems with which it deals. The number of people receiving service in homes of this nature, namely, the older members of our society, is rapidly increasing and therefore the demands to be made on this type of institution will correspondingly increase in the future.

The modern nursing home has risen largely out of a demand to care for the rapidly increasing number of elderly persons with varying degrees of disability. In its gradual emergence as a new type of social institution, it has not yet reached the stage of clear definition, but remains on the fringe of our social understanding both as to the problems and responsibilities it faces and the methods it uses in solving them. Many basic questions remain unanswered. Where does the nursing home fit into the field of medicine and into our society? What type of person does it serve? What type of services are being rendered and how well equipped are these institutions to provid these services?

The authors believe that one of the most pressing questions is that of evaluating the medical and nursing services being rendered in this type of facility, especially since a relatively small number of objective surveys have been made with respect to this question. There is little information available on the subject, and such a study seemed definitely to be warranted.

The Study

Scope of Study. Montgomery County, Maryland, presents an ideal area for such a study since within its boundaries are to be found a wide spectrum of socio-economic conditions, as well as nursing facilities. The County is one of 300,000 population containing highly urban as well as rural areas. It is adjacent to a large city and constitutes one of the larger portions of the surrounding metropolitan area.

This survey included all of the 33 institutions licensed under Maryland and County laws as nursing or care homes.

Method of Study. The study was carried out under the auspices of the Montgomery County Health Department and with the full cooperation and assistance of its staff. Prior to any field visits a letter was sent to the principal physician of each home explaining the nature of the survey and asking for their cooperation and support. The principal physician is that individual who, by means of a signed statement, agrees to accept the responsibility to respond to calls for medical care of patients in a nursing home not having private physicians and for all emergencies. Each home must have a principal physician before it can be licensed. In addition, the individual administrators were approached and an appointment made for a field visit at their convenience.

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Each home in the County was visited by one of us (B.H.O.) and all data obtained by him to insure uniformity in collection of information. The general approach used in the interview was to first explain the nature of the study and why it was being made. Secondly, the data was collected with the assistance of the administrator and other staff, as needed. Patient records were used where possible and additional information was obtained from the staff's own knowledge. Nursing home staffs were interviewed on each visit. As previously pointed out by Solon and Roberts[1] in their survey of nursing homes in 13 states, a basic limitation of the data is that it is based entirely on what the administrator and staff know and report about each patient and about the operation of their home in general.

Questions to be Answered.

1. What are the characteristics of patients in nursing homes and what services do they require?
2. How much medical and nursing service is available?
3. How well equipped from the point of view of qualifications of staff are nursing homes' staffs to render the services demanded of them?
4. To what extent is the nursing home meeting the needs of its patients?

Patient Characteristics. In order to properly evaluate the medical and nursing services provided in nursing homes, one must first know something of the degree of disability of their patients which in turn leads to a better understanding of what services they require.

Age. Perhaps the most outstanding characteristic of the nursing home is the age of its patients. The vast majority of the patients in nursing homes fall into the older age groups. Ninety-one per cent of the 540 patients surveyed were found to be 65 years of age or over, 74%, 75 and over, and a surprisingly large number, 27% are 85 and over. This is in contrast to the fact that only 9% of all patients surveyed were below 65 and a very small number, 1% were 45 and under. The patients surveyed in this study are slightly older, three-fourths over 75, than those in the survey of Solon and Roberts[1] in which the authors found that two-thirds were over 75 and one-fourth over 85.

Nursing homes are primarily homes for the aged. However, because of the numerous medical and nursing services these homes usually provide, it would be misleading to think of them as strictly home for the elderly. In fact, many of them have more of a hospital than a home atmosphere. The majority of nursing homes are better understood if they are thought of as lying somewhere between the two extremes of a hospital for the chronically ill on the one hand and home for the aged on the other. The nursing home is dual in character rendering both medical and custodial services.

Sex and Marital Status. In any population group, such as this one, in which there is a preponderance of elderly persons, one would expect that women would greatly outnumber men. In this survey women were found to represent 80% of the population in the nursing homes in Montgomery County. This is considerably more than the figure of 66% found by Solon and Roberts. Furthermore, as a result of a greater life expectancy on the part of women, there are more widows than widowers, and since widowhood itself predisposes to residence in a nursing home more so than if the husband were living, the elderly widow would be expected to predominate in the nursing home population. Such was found to be the case; 17% of women in the County's nursing homes had never been married.

Race. The survey revealed that Negroes accounted for 3% of the patients in nursing homes. This is somewhat less than the proportion of Negroes in the County's population which is 7 per cent. All of the negro patients were receiving public assistance under the State Welfare Program as compared to only 9% of the white patients.

The nursing homes in the County are segregated with the respect to race, thus there were two negro homes as opposed to 31 white homes. It is interesting to note that despite the large difference in the number of beds, 615 for white patients as compared to 18 for negro patients, the occupancy percentage was identical being 88% in both cases.

Residence. Residence is defined in this study as where the patient lived immediately before being admitted to the nursing home.

It was found that 61% of the nursing home population were from areas other than Montgomery County. Further analysis revealed

that 11% were from other counties in the State, 39% were from the District of Columbia and 13% were from other areas. Nursing homes do not necessarily serve only the population of the political subdivision in which they are located.

Financial Support. In interpreting the data obtained under this category, one must keep in mind the fact that Montgomery County has the highest per capita income in the United States. Thus it was not surprising to find that of the 540 patients in the survey, 474 or 88% were financed by means of private funds. This provides a striking contrast to the situation found by Solon and Roberts in which over half of the patients in proprietary nursing homes were receiving some form of public assistance. All of the 12% of patients in this survey who received public assistance did so under the State Welfare Program. This program pays up to $115.50 per month for nursing home care to patients meeting the eligibility requirements.

Length of Stay. Care of patients in nursing homes is on a long-term basis—many patients remain there for life. This is clearly brought out by the fact that 60% of the patients surveyed had been in the nursing home one or more years which is somewhat higher than the 50% whose length of stay was over one year found by Solon and Roberts. Of the 60%, 30% had been there 4 years or more. The length of stay does not represent time spent by the patient in other nursing homes or in hospitals, but is the time consecutively in the home from the most recent date of admission. Of the 40% of patients whose length of stay was less than one year, 18% had been there 3 months or less, 14% 4 to 6 months, and 8% 7 to 11 months.

Medical Aspects of The Study

Diagnosis. Only the primary diagnosis was recorded in this survey. In cases where multiple diagnoses appeared on the patient's record, the first one listed was taken as the primary diagnosis and the others were not recorded. Some of the medical records were incomplete and no written diagnosis appeared on them. In these cases the diagnosis was obtained from other records, such as prescriptions, physician's progress notes, or the data was obtained from the staff member found to have the most complete knowledge of the patient's condition. Information regarding diagnosis is less accurate than that in other categories, such as age, or length of stay.

The diagnostic categories were limited to include only those disease entities believed to be of major importance, at the same time keeping the "other" category as small as possible.

Cardiovascular Disease. Under this division are included arteriosclerosis, cardiac disease and cerebrovascular accidents, with or without residual paralysis. This category accounts for 55% of all patients in the study. (Solon and Roberts'[1] study showed only 40% of cardiovascular patients.) The major portion of these were diagnosed as arteriosclerosis. This is not at all surprising if one regards this condition as practically synonymous with the process of aging.

Senility. Only those patients listed by the physician as senile were recorded under this heading which accounts for 16% of all primary diagnoses. This term is a rather meaningless one in that it appears to serve as a "last resort" diagnosis, which is subject to varying interpretations.

"Other" Disease. This group contains cases which did not fall into any other category. Under this heading are to be found such diagnoses as: diabetes mellitus, Paget's disease, Meniere's syndrome (etiology unknown), silicosis, catatonic schizophrenia and numerous others. Also in this group are cases in which no diagnosis could be obtained. These cases account for 10% of the total. Solon and Roberts' study showed 19% in this category.

Fractures. Most fractures observed were of the hip, but this category also includes fractures of the arm and leg. This was found to be the primary diagnosis in 6% of the patients.

Arthritis. This includes both rheumatoid and osteoarthritis and was found to be the primary diagnosis in 4% of the 540 patients.

Neoplasms. Three per cent of patients were found to have some type of neoplasm. These were of varying types including cancer of the lung and brain tumors. Patients with diagnosis of neoplasm had the shortest length of stay in nursing homes.

These classifications of disease compared closely in percentage distribution with the

Solon and Roberts' survey. In addition, this group shows a slightly higher percentage of neoplasms and diseases of the nervous system. There is a lower incidence of fractures and arthritis as well as slightly fewer cases of senility.

A comparison of diagnoses in patients over 65 with those under 65 reveals the following (Table 1):

Patients under 65 show a much higher incidence of neoplasms, diseases of the nervous system and those classified as "other." The higher incidence of diseases of the nervous system, which constitutes 6% of the total cases, probably is due to the fact that Parkinson's disease and multiple sclerosis have their major incidence in somewhat younger age groups. This also would hold true for many of the other diseases classified under this category. In addition, the under 65 group shows a much lower incidence of senility and circulatory disorders.

Mental Status. Patients were classified as mentally confused, if, in the opinion of the administrator or staff, they were more confused than would ordinarily be expected at their age and because of this, required additional care. Using this definition, it was found that 277 of the 540 patients, or 51% were classified as being mentally confused. The degree as well as the manifestations of this confusion varied greatly. Some patients were reported as frequently wandering outside the institution unless watched; others talked loudly or shouted at those about them; and some were completely disoriented as to time and place. Although the County licensing regulation previously cited forbids the placement of psychotic patients in nursing homes, several were found. These included several who were diagnosed as schizophrenics, one of whom was a mute catatonic who shared the same room with a patient whose mental condition was clearly normal. This would not appear to be a proper environment for either patient. Mental confusion showed an increasing incidence with age, with an increase from 31% mentally confused under 65 years of age to 64% who are confused over the age of 85. Furthermore, the percentage is high for all ages. This appears to represent one of the main reasons why patients are placed in nursing homes.

Physical Condition. Patients were divided into three categories: (1) ambulatory, (2) partially ambulatory, and (3) bedridden. Those classified as ambulatory, 282 or 52%, were able to walk without any assistance or in some cases with only minor aids such as a cane. Those classified as partially ambulatory, or 20%, were able to walk only for a short distance without some major type of support. This information could not be obtained from the medical records, but was obtained from the administrator's and staff's knowledge of the patients. Twenty-eight per cent were reported as being completely bedridden. Furthermore, 30% of all patients in the homes surveyed were found to be incontinent of either feces, urine, or both.

A comparison with the data of Solon and Roberts reveals that the Montgomery County group shows a 7% higher prevalence of ambulatory patients and a lower number of those with more serious disabilities (Table 2). It would appear of value to emphasize that in both surveys by far the largest percentage of patients fall into the ambulatory classification.

Medications. Where medications were given, they were classified as follow:

1. Narcotics—narcotics including the synthetic narcotics.

2. Tranquilizing drugs—tranquilizers and some drugs such as Sparine which have a dual effect, acting as a tranquilizer and as a hypotensive agent.

3. Therapeutic drugs—those which re-

TABLE 1

COMPARISON OF PRIMARY DIAGNOSIS WITH AGE

Primary Diagnosis	*Per Cent Under 65*	*Per Cent 65 and Over*
Cardiovascular disease	40	56
Senility	7	17
Other	20	10
Fractures	0	7
Diseases of nervous system	18	4
Arthritis	7	4
Neoplasm	8	2

TABLE 2

COMPARISON OF DEGREE OF DISABILITY IN MONTGOMERY COUNTY SURVEY WITH THAT OF SOLON AND ROBERTS' THIRTEEN STATES SURVEY

Degree of Disability	*Montgomery County Survey*	*Solon and Roberts Survey*
Ambulatory	52	45
Partially ambulatory	20	22
Bedridden	28	33
Incontinent	30	35
Mentally confused	51	55

quire a prescription and which are not included above, and supportive medications such as vitamins.

4. Minor drugs—medications such as laxatives, aspirin compounds, and others.

This information was obtained in the majority of cases from the patients' records, and from administrators and staff where the records were incomplete. Only those drugs which the patient was actually receiving at the time the survey was made were recorded.

A review of the literature revealed no similar information with which these results could be compared. As is shown in table 3, 13% of all patients in nursing homes were receiving no medication of any kind at the time the survey was made. Of the 474 private patients only 51, or 11%, received no medication, whereas of the 66 receiving public assistance, 29% were not taking any drugs. Those patients under the Maryland Medical Care Program received only essential drugs for treatment and few supportive drugs such as vitamins.

The premise that only a very few patients in these nursing homes were suffering with pain is borne out by the fact that the over-all prevalence of those receiving narcotics is only 3 per cent. It is of interest to note that only 1 of the 14 patients in this category was classified by the administrator as an addict.

Of the 165 persons receiving tranquilizing drugs, 107 or 65% were classified as being mentally confused. This would appear to agree with the therapeutic purpose of these drugs. The remaining 35% fell into various diagnostic categories and the indications for this type of medication, though no doubt valid, are not clear from the survey. In addition, it was found that 30% of private patients received tranquilizers, while only 12% of the patients who received public assistance were taking them. This difference is perhaps due to the fact that until recently these drugs were not paid for under the Maryland Medical Care Program.

With regard to the 68% of patients who received therapeutic drugs, it should be pointed out that many received more than one and some as many as 4 or 5 different medications. Public assistance patients had fewer prescriptions for supportive drugs.

Minor drugs were being given to 246 of the 540 patients, or 45% of those studied. The vast majority of these drugs were laxatives.

Physical Visits. The number of physician visits to each patient within 6 months prior to the survey was tabulated. This information on 510 of the 540 patients was obtained from the patients' records where the visits were noted in the physician's own handwriting, or in some cases written for him by the administrator or staff member. In addition, it was decided to omit those persons who had been in the nursing home less than 6 months which left a total of 350 patients in the group.

Table 4 reveals that 64% of all patients on whom data was available had been visited by a physician at least 3 times in the 6 months prior to the survey. This seems to be a very commendable showing. However, 36% of patients had had 2 or less visits which includes 10% who had not been visited by a physician for at least 6 months.

An examination of the data reveals that private patients receive many more visits from their physicians than do those receiving public assistance, i.e., a median of 5 visits as compared to 2 visits to public assistance patients. Thus, we see that 16% of public assistance patients had had no visit from a physician for at least 6 months, as compared to 9% of the private patients. At the other end of the scale we find that no public assistance patients had received 16 or more

TABLE 3

PER CENT OF PATIENTS RECEIVING MEDICATIONS IN NURSING HOMES

Medication	*Per Cent All Patients*	*Per Cent Private Patients*	*Per Cent Public Assistance Patients*
Narcotics	3	3	2
Tranquilizing drugs	30	33	12
Therapeutic drugs	68	70	47
Minor drugs	45	46	45
No medication	13	11	29

TABLE 4

PHYSICIAN VISITS WITHIN SIX MONTHS PRIOR TO SURVEY

No. of Visits	*Per Cent of All Patients*	*Per Cent of Private Patients*	*Per Cent of Public Assistance Patients*
16 or more	8	8	0
11-15	5	6	2
6-10	28	31	7
3-5	23	22	31
1-2	26	24	44
No visits	10	9	16

visits, whereas 8% of private patients fell into this category. From this it appears that the private patient is more closely supervised by his physician than the patient who receives public assistance. The majority of patients in nursing homes appear to be visited adequately by their physicians. However, there is a disturbing number who have had no visits in the past 6 months and many more who have had only one or two visits by their physicians.

Nursing Home Characteristics

In the following portion of this study entitled, "Nursing Home Characteristics," an attempt will be made to determine how well equipped the nursing home is to fulfill the needs of its patients.

Total Beds Available. Montgomery County nursing homes have a total of 623 beds which serve its 300,000 people on a ratio of 2.1 beds per 1,000 population. This is considerably higher than the ratio of 1.2 beds per 1,000 population found by Ellicott[2] in his survey of 9 Eastern Shore Counties (Maryland) having a combined population of 241,000 people. However, it must be remembered that 61% of the patients in this survey were from areas other than Montgomery County and thus the ratio of 2.1 would be far lower (approximately 1.4) if the number of persons in these areas who draw on the County's facilities were taken into account.

Charge Per Month. There is a great deal of variation in cost per month for nursing home care. The average rate is $200 per month, but this varies from $110 to $400 per month, which depends in most instances largely on the number and qualifications of the staff and also on the adequacy of the physical plant. Solon and Roberts[1] found the average cost in their survey to be $153 per month, however all of the homes surveyed are privately owned, profit-making institutions.

The public assistance patients receive $81 per month less than the average monthly charge to private patients. Only one home in the entire County was found to have a minimum monthly charge for a private patient which was below the grant given to the Welfare recipient.

Staff. The full-time personnel of the nursing homes surveyed were classified into various categories depending on their formal qualifications and occupational duties. There was a total of 264 full-time staff members serving the 540 patients or a ratio of approximately two patients per staff member. This excludes one physician who was the owner and administrator of two nursing homes in the County. More significant than the above is the ratio of the number of patients compared with type of personnel.

As is shown by table 5, non-nursing personnel account for 38% of the total staff of the nursing homes surveyed. Non-nursing personnel includes maids, cooks and those classified under the category labeled "other personnel" which includes business managers and clerical help. While these people are in many respects essential to the proper operation of the facility, they do not render any direct service to the patients in the institution.

Nursing personnel make up 62% of the total. This number includes registered nurses, licensed practical nurses and unlicensed nursing personnel. Of great significance is the fact that only 5% of all nursing home personnel are registered nurses, or in other words there are 38.5 patients for each registered nurse. This is the highest ratio in any category, even though the high degree of disabilities in patients would appear to require more registered nurses. Only two nursing homes in the County have a registered nurse on duty 24 hours a day. Only 9 homes of the 33 surveyed have a registered nurse on their full-time staff. Fourteen homes have no registered nurse or licensed practical nurse on their staff. Some of these homes, however, render only those services referred to as "personal care services," but many of them provide principally nursing service. For example, one home had 42 patients, 50% of whom were severely limited in walking or

TABLE 5

NURSING HOME PERSONNEL

Type	*Per Cent of Total*	*Ratio—Patients/Staff Member*
Registered nurse	5	38.5
Licensed practical nurse	11	17.4
Other nursing personnel	46	4.4
Maids	15	13.5
Cooks	10	20.7
Other personnel	13	16.8

could not walk at all, and an additional 30%, all of whom were incontinent. In addition, the majority of these patients received some type of prescription drug. Not only was there no full-time registered nurse available, but there were no licensed practical nurses on the staff. The survey pointed up the need for more adequate supervision and care of patients by formally qualified personnel. Thus, the majority of supervision and care is being given by unlicensed nursing personnel, who in the majority of cases have had little or no formal training.

Acceptability for Licensing. Homes were classified as, (1) more than meeting the requirements of the licensing code, (2) meeting only the minimum requirements of the regulation, or (3) not meeting the requirements for licensing. Of the 33 institutions surveyed, 7 were classified as more than adequate, 21 were declared to be meeting only the minimum requirements and 5 were believed to be below standard. This classification was made by the Montgomery County Health Department. Two of the 5 homes classified as below standard had a combined total of 61 patients and rendered nursing rather than personal care services. The major reasons for declaring these homes to be below standard were that they did not have an adequately qualified staff and that their physical plants left much to be desired.

Conclusions

Although the scope of this survey was not as large as others which have been done in this field, we feel that this does not lessen its validity. Nursing homes seem to be basically similar wherever they are found. On the basis of this, it is felt that the survey presents an accurate picture of the nursing home and its patients.

We have found that the patient who requires nursing home care is an elderly individual who suffers from some degree of mental and/or physical disability and who, therefore, needs care which cannot be provided in the home. The care which he requires is not that which is given in hospitals or can be given in the home for the aged, but lies somewhere between these two extremes. Care is based on both social and physical needs and this type of institution must therefore serve as both a home and a place where nursing service is provided. The social needs of nursing home patients take on an added importance when one considers that many, if not most, will remain in these institutions for the rest of their lives. At present, little or nothing is being done to meet the social needs of nursing home patients. There have been only scattered attempts at rehabilitating these people, the vast majority have never been visited by an occupational or physical therapist, in fact, the major portion of the average patient's day is spent in idleness. Lack of stimulation may well be responsible for much of the mental confusion among these patients, many of whom should still be able to contribute in some way to the betterment of the community. Nursing home patients are not homogeneous, but present a wide range of disabilities. The homes present a varying ability to provide professional services.

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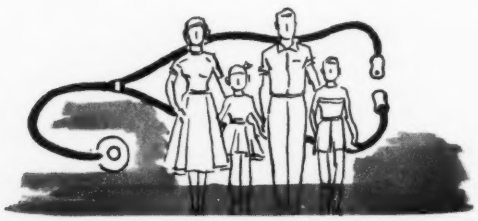

Optical Aids for Persons with Subnormal Vision*

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New Orleans, La.

Great advances have been made in recent years for the provision of visual aids for certain patients having vision which is seriously impaired.

THIS PAPER is an attempt to show how persons with very low visual acuity can be fitted with special glasses enabling them to live a more normal life. Fonda, the Director of The Lighthouse for the Blind in New York, states that 72% of the people he fitted with special lenses were judged to have had a successful result.

Congenital cataracts, which had been operated upon, microphthalmus, macular degeneration, and myopic chorioretinal degeneration seem to be the conditions most promising for such aids. Diabetic retinopathy, retinitis pigmentosa, atrophy of the optic nerve and glaucoma offer the least promising results, since the field of view is reduced by every magnifying device. Visual aids are valueless if acuity is below 4/200 or counting of fingers at 2 meters. Visual impairment of the conduction type responds better to a visual aid than do perceptive disorders. In small demarcated macular lesions the spreading effect of magnification may give an acuity far better than anticipated.

Motivation is extremely important in the patient's acceptance of a visual aid. If visual acuity is 5/200 or better and without a constricted visual field, the patient is a good candidate for assistance. Often old people will not accept the strong reading corrections. Those with rigid reading habits have trouble in adjusting to a close reading distance. A compromise arrangement is possible in which a weaker reading addition is combined with a hand loupe.

For near vision, magnification of varying degrees can be obtained by use of several devices, loupes, high plus additions, telescopic units with plastic add caps, microscopic lenses, and an apparatus for projection enlargement. Records should contain notation of three factors: the visual aid used, size of print read, and reading distance. As magnification increases, reading distance and field are decreased. Thus, if the addition is plus 8 D., the print is magnified twofold, but the vision is fixed to the principle focal plane of 8 D. or 5 inches. The retinal image from an object at 5 inches is twice as large as that from the same object at 10 inches. Magnification should be no greater than the predominant needs of the patient. Final tests should not be on a reading chart but on a telephone directory or the like. When a vocation demands reading a certain type of print, it is wise to tell the patient to bring this with him. Special near vision cards with considerably larger print are helpful, as those prepared by the Visual Press. An important point is a period of adequate training before the final prescription. It is often found that after repeated examinations a lesser magnification is adequate than first supposed.

Loupes. An ordinary convex lens, the simplest type of magnifier, is widely used as a hand-reading glass or loupe. The field is limited not only by the diameter of the lens but also by marginal aberration and seldom exceeds 10 to 12 degrees. The field decreases also as the distance of the loupe from the eye increases.

Spectacle magnification. A simple spectacle magnifier consists of ordinary spectacles fitted to give one or both eyes a closer focus. Magnification is obtained simply by reducing the reading distance. With strong near additions, the magnification is one-fourth of the

*Read before the Section on Ophthalmology and Otolaryngology, Southern Medical Association, Fifty-Second Annual Meeting, New Orleans, La., November 3-6, 1958.

total dioptric power. In bilateral amblyopia of moderate degree, both eyes may take high plus additions up to 6 diopters, but a prism base in must be added so the convergence may be maintained without undue fatigue. For monocular magnification the American Optical Company provides plus 8, plus 16, and plus 24 D. using a spot diameter of 25 mm. and minimizing marginal aberrations. High plus additions are preferable because they are simple, economical and conventional in appearance. Binocular vision can be achieved with additions up to plus 8 to plus 10 D.

Microscopic lenses. The American Optical Company microscopic lens is good and is available in powers up to times ten. Binocular vision may be obtained in the times 2 strength. These are attractive in appearance and are put in as a bifocal lens in regular glasses, so that a distance correction is present also. The Volk conoid is superior to a plus 10 D. sphere because many partially sighted patients have nystagmus or eccentric fixation; the aperture is much larger with a Volk conoid which provides correction of 10 D. to 100 D., heavier than Feinbloom. The Feinbloom has lenses from times 4 to times twenty.

Telescopic aids. To use telescopic lenses the patient must be stationary. Cheapest is a monocular appliance of twofold magnification that can be clipped over the spectacle lens of the better eye. The Kollmorgen appliance has units of 1.7 and 2.2 magnification; distance correction and reading addition snap on to the rear and front of the unit, respectively. The maximum magnification for near vision is 6.6, which is equal to a simple plus addition of 26.5 D. The advantage of a telescopic aid is that there are less marginal and chromatic aberrations, and the focal point is 3 inches instead of 1.5 inches. Telescopic spectacles for near vision that provide a 3.5 magnification have a field of 5 cm., the width of the narrow newspaper column.

The Univis telescopic lens is inserted in the patient's distance correction at a position the bifocal segment usually occupies. It comes in 1.5 and 2 magnification with reading additions of plus 4 D. to plus 10 D.

Bechtold and Feinbloom independently designed air-spaced compound-lens systems that give up to 14 to 20 magnification. Lightness is achieved by use of plastic lenses and incorporation of the correction into the near lens.

Projection enlargement. Magnification of opaque material by putting it face down on a transparent plate and projecting it on a screen has been used successfully in the classroom. There are 2 types, the Franklin Institute model enlarges 3 and 5 times and is good for vision at around 15/200. The megascope has been helpful in some cases of vision as low as 3/200.

In conclusion, it has been our experience that older people do better with two pairs of glasses, a Feinbloom telescopic lens for distance, and an American Optical Company microscopic lens used as a bifocal for near vision. Children of school age do well with the Feinbloom appliance for distance to see the blackboard, and do remarkably well by slipping on the plastic cap add for close reading at the desk.

Discussion (Abstract)

Dr. George M. Haik, New Orleans, La. Patients handicapped by subnormal vision are patients of ophthalmologists from the onset. Examination of patients with subnormal vision is only an extension of a routine eye examination. Such an examination should not be delegated to an individual who is not completely or thoroughly trained in the management of eye diseases or refractive errors. It is a mistake to turn these patients over to residents who are undoubtedly unqualified in the management of the more difficult refractive errors and they are, therefore, not qualified to handle these refractive problems. Refraction for a person with subnormal vision is almost always more difficult than the average. A knowledge of the type of pathologic change, muscle balance and visual fields influences the examination of a patient with low vision.

Does the General Practitioner Deserve Hospital Privileges?*

LOWRY H. McDANIEL, M.D., *Tyronza, Ark.*

THIS QUESTION NATURALLY can have many replies depending upon the viewpoint of the one answering the query. Does the lazy, indifferent, careless, negligent, incompetent G.P. deserve a place on the staff of your hospital or anyone's hospital? Certainly he does not and the quicker we protect the public and the fair name of every disciple of Aescalapeus by justified discipline the sooner that dead weight around the neck of medicine will be lifted.

The next question should follow just as surely as night follows day or vice versa. Does the efficient, studious, clear thinking, conscientious G.P. deserve the privilege of admitting, diagnosing, treating and relieving his patient in the hospital where opportunities for efficient treatment are at the finger tips of every physician? To even bring up such a question should cause the listener to wonder why the query should ever arise in the first place—whether after all is someone straining at a gnat and swallowing a camel.

To pursue any problem to a justified conclusion, to prevent quibbling, to eliminate the and's, but's and if's it becomes immediately necessary to understand the subject under discussion. With that idea in mind may I give you the definition of General Practice as approved by the Congress of Delegates of the A.A.G.P. meeting in St. Louis last March. I quote, "General Practice is that area of medical care performed by a Doctor of Medicine in those fields of diagnosis and therapy commensurate with his professional competence, assuming a total continuing responsibility for the health of the individual or the family as a unit." There it is—short, concise and true, yet complete, logical and impressive. That physician who follows the above limitations as well as qualifications is the General Practitioner.

We doubt the wisdom of a practitioner trying to school himself to do such major league surgery as stomach resections, intestinal resections, radical and complicated breast removals, thoracic and vascular surgery, lobotomies, ruptured disc, etc. If he has been schooled himself to do all that then he is a competent surgeon and no longer a G.P.

Teamwork in the medical profession over the last half century has enabled mankind to add 20 years of human life and human endeavor, 6,000 man work days—60,000 man work hours—$60,000.00 more income to your family if you have been a dollar an hour man. If you have been a $5.00 an hour man then the medical profession has enabled you to bring home almost a third of a million dollars with that 20 extra years of human endeavor. And now, when we can see the war against disease being won in the not too distant future, a ripple has appeared to jeopardize the serenity of the medical profession,—the greatest team ever assembled for the betterment of mankind with the exception of the Christian ministry, a ripple just now in the form of certain staffs or certain administrators excluding or trying to exclude certain members of this winning team from the fruits of their joint victory and the opportunity to continue serving their fellowman either in or out of the hospital as the case may be.

In discussing this matter with calmness, with reason, without rancor and bitterness, naturally many questions arise. Why should any physician be allowed to practice medicine at all? What are the duties and also the obligations of the surgeon, the internist or the General Practitioner? What niche in medicine does each fulfill? Does each one's niche necessitate hospital privileges? If your answer is no we might just as well turn it over to socialized medicine and forget your ethics, your ambition, your physician-patient

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relationship and be Dr. #103,251 in panel #428XYZ. If your answer is yes, just what privilege should each have? Certainly the defining of General Practice a few moments ago shows the G.P. should prescribe and render "Therapy commensurate with his professional competence," whether in the hospital, clinic or at the patient's bedside. After all is it desirable, feasible or economically possible to make a specialist out of every graduate of medicine?

If every physician is trained to be a specialist who is going to treat this 85% of people whose complaint does not require hospitalization? If we do have hospital privileges what should limit the privileges granted? Is the keenly trained specialist to take every one of his patients to the hospital and examine each one as meticulously as Dr. Peterson and his group demanded from the North Carolina General Practitioners? I mean this 85% capable of being relieved or successfully treated by a G.P. If the specialist does squeeze out and make obsolete the Generalist is he willing to take over this 85% of complaints and render service to them? Far be it from me to beat my breast in a holier than thou attitude and question the motives of that segment of medicine who would throw off half the team in accusing the latter of ghost surgery, excessive surgery, incompetence and downright dishonesty. Does the specialist mean that he will make house calls when a hospital bed is not available?

You know Gentlemen that does happen frequently in so many communities where hospital beds are still inadequate in number. Is the G.P. to make these house calls then and when the hospital bed is available is he to bow out gracefully or is he to be stopped at the hospital entrance regardless of his training, ability and experience. After all the hospital was built for the patient and not as a private hunting preserve for any group or combination of groups in medicine. May we not sow the wind lest we reap the whirlwind.

We rejoice in all measures to keep the untrained man, the eager beavers, the knife conscious, the operation happy, out of the operating room. I am sure that to describe one of that group as too enthusiastic surgically is a gross understatement of fact. But to embarrass qualified, experienced, conscientious physicians—call them General Practitioners if you please—by erecting a barrier at the hospital entrance is autocratic, unsound, unreal and positively detrimental to that one more deeply concerned than all the rest involved—your patient and mine. After all why do we have hospitals, nursing homes, medical schools, clinics, sanataria, the medical and surgical equipment manufacturers, pharmaceutical houses and drug stores? There is but one answer to the question and that answer is the *patient*. May we be certain that his rights are protected even before the whims, the jealousies, or the incomes of any segment of medicine.

If we can make a person think any matter through calmly, deliberately and without bias then the justified conclusion is the inevitable result. Let us examine this question from another viewpoint. I will propound two or three more questions which we do not believe are leading.

First, does it serve the public's interest to cut off 60% of the doctors from the hospital, the fountainhead of therapeutic knowledge and information or does it serve the specialist alone?

Second, is it in the interest of the patient to rule out his free choice of a physician who shall treat him at the office, bedside or hospital? Have you gentlemen forgotten that we offered as the basic argument for prepaid insurance against socialized medicine the right of every man for his own religious, political and personal habits and choices which includes his medical advisor?

To lay down a rule, as some members of the profession now propose that a patient may enjoy that freedom of choice as long as he is ambulatory and calls at the doctor's office, or so long as he is ill at home and his physician can come to his bedside, but that he forfeits that basic right when he enters a hospital is treading on very thin ice. Do they want to reduce the patient's right of free choice by one-third? Who knows but that tomorrow that group flushed with newly acquired power may try to dictate their method of applying a band-aid or administering an antibiotic?

Third, should any man, more especially the physician, be cut off from his workshop where he can learn even more so that he can give better service on down the road?

Fourth, is it moral, ethical or legal for one segment to abrogate to the whole of medicine policies that are vicious, autocratic, dictatorial and wholly beyond the concepts of free medicine?

Fifth, if the G.P. should not have hospital appointments, we must conclude that our medical schools are completely negligent, our licensing boards are wholly irresponsible, and that hospital and specialty boards—which are not licensing agencies and have no educational status—are the only ones capable of determining educational needs and providing adequate educational and licensing standards. These are absurdities, and finally, may I again emphasize that we are not defending incompetence, giving privileges to the untrained man, nor lowering standards of care, we are instead recognizing the General Practitioner as an important and qualified member of the profession, evaluating all physicians some strong, some not so strong, some efficient, some not so efficient, some successful, some not so successful, some being surgeons, some being internists, some being experts in public health and some being General Practitioners and granting privileges to all who can show competence, ever remembering the fact that some bright students make good doctors though they are G.P.'s—the Ira Parks, the Steve Kenyon, the Buck Pressley, the G. A. Warren, the W. T. Wooten, the Wick Anderson, the Dave Miller, the M. L. Norwood, the Philip Fortin, the R. C. Dickinson, the J. L. Baird, the Homer Stroud, the L. A. Yarbrough who delivered me, the John Bender, the Dick Mills, the Andy Tomb, the Tom Robinson, the Dwight Murray, the Charles MacArthur, the Frederic Ewens, the Phillips Frohman, the Lester Bibler, the Irv Baumgartner, the T. E. Rhine, the Fount Richardson, the Walter Sackett, the George Thorpe, the Andy Hall type of physician is what I mean—yes, even include those great medical missionary souls as Walter Judd, David Livingstone and Albert Schweitzer—everyone of them General Practitioners if you please,—and be it remembered that some weak students make poor doctors even though they may obtain a board certificate with no names mentioned.

I must tell you a true story, and truth is always stranger than fiction. A certain well trained and experienced General Practitioner in a city not too far away from my home town was recently confronted with a new rule that required a board member in obstetrics to give permission before the G.P. could apply forceps which detained the patient in question on the delivery table over two hours. When the board member arrived it happened that this G.P. had delivered by forceps this young board member some 30 years before and that the G.P. had delivered over 3,000 babies before and 3,000 since the birth of the younger man which was in excess of ten times the deliveries performed by the young physician holding the board certification. How absurd we mortals—including some hospital boards—can be at times!

I now give you the central thought of my paper—the essence of my address.

The best medical care can always be given when the G.P. and specialist work hand in hand together and not against each other. Our interest should be to get the "team" to work for the patient, not sacrificing the G.P. or any other member of the team on the altar of expediency, jealousy, greed, or board idolatry—this team that has added 20 years to human endeavor to your life and mine.

Practically all segments of medicine have grouped themselves under the qualifying boards. After all why shouldn't we before some energetic group takes it upon themselves to attempt to assimilate the G.P.? We, and we alone, now compel our membership to continue a certain amount of intensive training. Possibly the time is ripe to make further demands on those entering our group and a new lustre will be added to the title of General Practitioner.

This picture in color of Fildes' painting "The Doctor" plus the modern version are the only slides used or scenes portrayed in our presentation. It tells the story of the General Practitioner of medicine as no words can tell it. It represents our profession at its highest peak. The sick-room portrayed is a room in a very humble home, yet it has a certain grace. In the window there are potted flowers and a song bird. As one looks at the room, he thinks of the modest homes portrayed, or suggested, in the immortal poems of the plow-boy poet, Bobby Burns.

A sick little girl is lying on a bed improvised of two chairs, an over-large pillow and some blankets, a stool stands at the little

patient's head and on it are a bowl and pitcher. There is a table back of the chairs and on the table the mother's arms are folded, and on her arms her head is bowed in the grief which only a mother can know. Behind the mother stands the little girl's father. He is not looking at his child: He is looking at the doctor with eyes of faith and hope and prayer. Prayers have been represented by many physical attitudes, but this father's whole countenance is a prayer. To look at his face over-long will wring your heart. But the focal figure in Fildes' immortal picture is that of the physician, a General Practitioner. His strong features are reminded of the great stone face in Hawthorne's memorable story. He is seated by a small, round table, on which stands an old-fashioned kerosene lamp, its shade capable of being turned so as to shield the little patient's eyes from the direct light.

The doctor's right hand rests upon his knee. He is leaning forward, toward his little patient. His strong, bearded chin rests in his left hand. Strength and intelligence are in his countenance. There is no selfishness here, no greed, no jealousy, no glamour. The sympathetic concern of all healers of humanity's hurts is mirrored in his face. How easy it is for me to see Dr. Dave Allman with his 38 dedicated projects in nonprofit organizations as an even more modern version of this picture. This doctor portrayed has a reverence for life which makes him a co-worker with the creator of life. He is acquainted with the crises of joy and sorrow. Underneath his cheerfulness and sense of humor, and all the rest that makes life noble, runs a current of confidence in a power beyond himself. If the universe is rational and preserves its highest values this friend of human well-being, this enemy of human woe, shall be held in everlasting remembrance. To be of his tradition, and in his succession, is sufficient honor for any physician. To have this General Practitioner's approval is the profession's ultimate benediction. Gentlemen, you who have viewed this picture in color on our screen have just beheld the reason why America does *NOT* choose "socialized medicine." The young physician we have portrayed is just a later edition of the noble disciple of "The Great Physician," we have just described so minutely.

I cannot think of a better way to close this address than in the words of Dr. Frank Crane's notable "Prayer of the Physicians":[1]

"We pray, O God, that we may have absolute intellectual honesty. Let others fumble, shuffle and evade, but let us, the physicians, cleave to the clean truth, assume no knowledge we have not and claim no skill we do not possess. Cleanse us from all credulities, all fatuous enthusiasms, all stubbornness, vanities, egotism, prejudices, and whatever else may clog the sound processes of our minds. These are but dirt; make us living personalities as aseptic as our instruments.

"Give us hearts, but let our feelings be such as shall come over us as an investment of power, to make our thoughts clear and cold as stars and our hands skillful and strong as steel. Deliver us from professionalism, so that we may be always human, and thus minister to sickly minds as well as to ailing bodies. Give us constant realization of our responsibility, for people believe in us and into our hands they lay their lives. Let us, of all men, be sober and walk in the fear of eternal justice. Let no culpable ignorance of ours, no neglect nor love of ease, spoil the worth of our high calling.

"Make our discretion strong as religion, so that the necessary secrest of souls confided in us may be sacredly kept. Give us the joy of healing. We know how far short we may be of being good men; but dear God, make us good doctors. Give us that love and eagerness and pride in our work without which the practice of our profession will be more fatal to us than to those under our care. Give us a due and decent self-esteem, that we may regard no man's occupation higher than ours, envying not the king upon his throne so long as we are prime ministers to the suffering.

"Deliver us from playing at precedence, from hankering for too much praise and prominence, from over sensitiveness and all such forms of toxic selfishness. Give us a just remuneration for our endeavors, an adequate honorarium as our beloved Dr. Elmer Hess so admirably expresses it; not so little that we cannot have the leisure we need to put quality into our service; not so much that we shall grow fat in head and leaden in heart and forsake our sense of ministry

for soft indulgence. Give us courage, but hold us back from over-confidence. Let us so discharge the duties of our office that we shall not be ashamed to look any man or woman in the face. And when at death we lay down our task, may we go to whatever judgment that awaits us, strong in the consciousness that we have done something toward challenging and conquering the innumerable tragedies of life."

Reference

1. Chairman's Address, Section of G.P. June 8, 1955, A.M.A. meeting Atlantic City, New Jersey.

Discussion (Abstract)

Dr. Richard F. Sinnott, Ft. Pierce, Fla. Of the thousands of words spent on this subject of the general practitioner and hospital privileges, four points seem basic.

First. One cannot rightly argue that four years of medical school and an internship give to the new graduate the skill or the wisdom or the moral right to assume sole responsibility in a critical illness when more expert care is available for help and consultation.

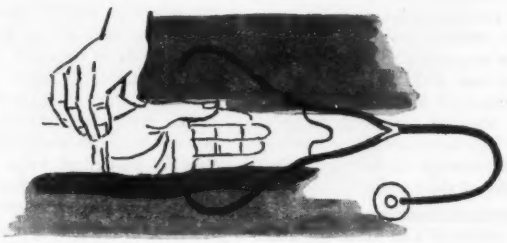
Second. Despite the self evident nature of that statement, the contrary caricature of the philosophy of general practice is attributed to us by those figures high in organized fragments of our profession whose ideology would destroy medicine as a profession by dividing it into a federation of unions, each proscribing with jealous and artificial caprice the privileges of its members and subordinating the whole to an administrative bureaucracy whose tyranny would be proportionate to its corrupting power.

Third. The hospital privileges of any physician including the general practitioner should be based upon the traditional and just concept of demonstrated competence.

Fourth. The fourth and last point seems often ignored but is really the key concept in the philosophy of general practice. A hint of recognition of its truth is accorded even by the American College of Surgeons in its grudging "grandfather clause"—but let us phrase it more specifically:

Privileges must grow with experience and maturity.

(And a corollary here which must sometimes be stated even though it seems obvious to right minded men is the historical and psychologic fact that competency does not necessarily depend upon certification or upon any other single prescribed method of learning.)



Headache Due to Absorption of Lanolin*

BOEN SWINNY, M.D., *San Antonio, Tex.*

A DEGREE OF COURAGE is needed to present another cause for headache, the most frequent discomfort of the more advanced civilizations. The reported causes are multitudinous and drugs for relief are available almost everywhere from barber shops to planes, trains and restaurants.

In the first three cases here reported of headache due to lanolin, the intelligent patients suggested the cause. With the fourth case I had developed sufficient awareness to discover the cause.

Case 1. Mrs. T. W. L., age 34, presented herself on Oct. 5, 1950, with the complaint of recurrent headaches for as long as she could remember. Although her attacks formerly had been intermittent and infrequent, during the last 2 years she had never been free of some aching, with exacerbations of great distress, pain and sense of fullness across the frontal bulge, bilateral, associated with edema and erythema of the eyelids.

The family and personal history were negative for allergic disease except that she had had a rash on her neck in the past spring diagnosed "neurodermatitis." The food and drug history were negative except for the fact that both Scotch and bourbon whisky would intensify her headache.

All studies with intradermal testing and elimination diets failed to elicit the cause and we gave up.

In January of 1953, she returned with the dermatitis of her neck, and still with her headache. Contact testing with her cosmetics gave definite positive reactions to her two cream shampoos as well as to pure lanolin and wool. The intradermal test with wool was negative. She returned in 2 weeks with her neck clear and entirely free of headache. She has remained entirely free of headache except on two occasions when lanolin preparations, without her knowledge, caused headache to return within a few hours of their use.

Case 2. Mrs. C. C. E., age 49, came on March 31, 1953, with hay fever, nasal blockage and drainage, and severe recurrent bilateral frontal headaches associated with extreme swelling of the eyelids and blurring of vision. Definite clinical sensitivity to our major inhalant allergens were proved by skin testing and excellent relief of the nasal symptoms was obtained by hyposensitization. The headaches and eye symptoms persisted. Food and drug sensitivity could not be found by history, skin tests or trial diets.

In July of 1953, she came in with definite acute periorbital dermatitis. Contact tests revealed positive reactions to her cream shampoos and pure lanolin (she had a positive reaction on the intradermal test for wool). Avoidance of these caused her eyes to clear and her headaches to cease. This patient has remained symptom free except on one occasion when her beautician forgot and used a cream shampoo. Within 12 hours following the shampoo her headache and eye symptoms recurred. She did not know a cream shampoo had been used until she phoned her operator.

Case 3. Mrs. J. O. N., 42, has been intermittently under my care for fall and winter nasal blockage since Nov. 4, 1954, with excellent results from treatment with ragweed, cedar, dust and molds. She had no difficulty during the fall and winter of 1956, but returned to my office Oct. 16, 1957, with generalized swelling of the face and neck associated with constant dull headache, for which an internist had prescribed acetazolamide without relief.

This intelligent patient had for some years used a great deal of pure lanolin on her skin and had observed that when she greased her face with it she became worse. A contact test with lanolin on the arm gave an edematous local reaction with slight erythema. On advice she eliminated all products that contained lanolin and her headache and swelling subsided. Five weeks later, following a scalp treatment, she was seized within one hour with severe headache, nausea and vomiting. She phoned her beauty shop operator and learned he had used a lanolin preparation against her instructions. Within 2 hours followin a soap shampoo her headache and nausea subsided.

Case 4. Miss P. M., aged 17 years, complained for 5 or 6 years of constant, dull headache with attacks of sharp pain in the right temporal region radiating to the right side of neck. She had a patch of itching dermatitis about 3 by 4 inches below the right ear. Seborrhea of the scalp improved with selenium sulfide (Selsun) prescribed by a dermatologist. She had positive contact tests to pure lanolin and to 2 shampoos. The patient discontinued the use of these preparations and continued the selenium sulfide and pHisoderm. Headache and dermatitis disappeared within 10 days.

I do not know the mechanism of these headaches. Patient No. 3, Mrs. J. O. N., suggested a cause, "Doctor, if my face swells from lanolin, why can't my brain also swell?"

Conclusion. The physician must consider an additional cause and mechanism of headache,—the absorption of substances through the skin.

*Read before the Section on Allergy, Southern Medical Association, Fifty-Second Annual Meeting, New Orleans, La., November 3-6, 1958.

Discussion (Abstract)

Dr. Henry D. Ogden, New Orleans, La. First of all, I would like to congratulate Dr. Swinny on a most interesting presentation. I have not seen in the literature any reference to headache caused by the absorption of lanolin. This may help to explain some of the cases that appear to be allergic, but in whom we are unable to locate the causative antigen. After all lanolin is rather widely used.

Absorption through the skin is not a very common way for an antigen to gain entrance into the body. We should, however, remember the old statement that an antigen may be inhaled, ingested, rubbed in or absorbed from a bacterial focus. Dr. Swinny has reported that in all of his cases a positive patch test was elicited to lanolin.

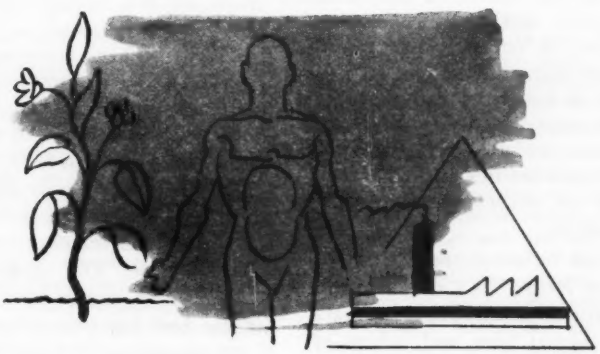
What is the mechanism of these reported cases of headache? Dr. Swinny has definitely proven his point and has been able to bring on attacks of headache at will by the use of lanolin. Is it a local type of vascular reaction? After all, we know that some unusual blood vessel changes may occur in certain cases of headache. I am inclined, however, to feel that the action of the lanolin is systemic, by that I mean that the antigen is carried in the blood stream.

Divergent views are held by various workers in the field of headache, actually to the point where they do not talk the same language. As an example, tension headache to one may mean that type of headache which accompanies or follows emotional tension or stress. To another worker, tension headache signifies the muscle tension pain or myalgia which often is a part of the headache pattern.

Another great discrepancy is seen in the diagnosis of histamine cephalalgia. In my statistical studies, I found that this particular syndrome is definitely rare in occurrence. I cannot help but feel that many cases of so-called histamine cephalalgia, are in reality frontal headache.

Regardless of the *modus operandi,* I feel sure that this paper will do much to make us aware of still another allergenic cause of headache. I for one—will commence investigating lanolin as a possible cause of recurrent headache.

I am puzzled by the fact that the patient Case 4 continued to use Selsun and pHisoderm, the latter preparation contains lanolin.



EDITORIALS

RACIAL DIFFERENCES IN CARDIOVASCULAR DISEASE

Most doctors of the southern states in some phase of their professional work deal with patients of two races, the Caucasian and the Negro. Probably many of these physicians have developed impressions from their observations relative to the comparative course and incidence of disease in the two races. Many of us undoubtedly have gained impressions especially with regard to differences in the cardiovascular diseases as related to race.

It need not be reiterated that impressions are far from conclusive and need confirmation by accurate observations and studies. A recent valuable service by Phillips and Burch[1] has been a review of over a thousand reports which have considered racial factors in cardiovascular disease. They quickly learned that many limitations in the reported studies prevent any absolute deductions at this time. This finding in itself is of importance since it indicates the need for setting up, and careful conduct of studies to clarify impressions in this area of medical knowledge. The reviewers point to the numerous errors which appear in the over one thousand reports in selection of material, statistical approaches, lack of correlation of control factors, and many others. However, though no certain conclusion can be drawn from this extensive review of the literature, certain trends are quite clearly shown—trends which appear to be similar in different studies and thus most probably provide an acceptable answer to some of our questions.

The reviewers go to some trouble to define the "American Negro" as a distinct type, which must be kept in mind when comparisons are made between him and others of his race in other parts of the world. The American Negro's negro blood is derived from the tribes of the West African Coast. For three centuries there has been miscegenation with Mongoloid (American-Indian) and Caucasian races, the latter of origins from the several areas of Europe. Thus, the "American Negro" is biologically distinct from other Negroes of the world, a fact to be recalled in comparisons of his cardiovascular disease with that of the Bantu of South Africa or even of the Western African Negro. This is an important point since any student of cardiovascular disease appreciates the genetic factors which must play a part in such diseases.

As between the races there seem to be such anatomic differences as in the azyos system of veins, the position of the coronary ostia, and variations in the diameter of the aorta. There seem to be physiologic differences in the response to immersion in cold water, and in the cold pressor test. Numbers of studies having to do with the deposits of lipids in the aorta and with coronary atherosclerosis, and with disease of the renal arteries are recorded in the literature on pathologic changes, indicative of trends of differences as between the American Negro and the other Negroes and Caucasians.

From a historical viewpoint, the reviewers say the patterns of heart disease must be divided into the pre-antibiotic and the post-antibiotic eras because of effects on types of heart disease related to infection. (Editorial comment, to keep perspective in focus, would emphasize that important public health control measures antedated and coincided with antibiotics in control of certain of these infections.) The control of a number of infections, at least to some degree, has naturally resulted in an entirely different balance as related to the incidence of certain forms of heart disease. The review by Phillips and Burch shows trends which may be accepted as the best for the present.

Hypertension is twice as common in the Negro as in the white. All reports agree that the incidence of hypertensive disease, and the attendant morbidity and mortality are greater in the Negro. What is reported for the American Negro does not necessarily hold true for the African Negro.

On the other hand arteriosclerotic heart

1. Phillips, J. H., Jr., and Burch, G. E.: Cardiovascular Diseases in the White and Negro Races, Am. J. M. Sc. 238:97, 1959.

disease and coronary artery disease seem to have a different pattern of incidence. Various reports generally agree that this type of heart disease is more frequent in the white race in ratios even up to four times that in the Negro. However, there are as striking differences between the American Negro and his counterpart in Haiti and Central America, and his cousins in Africa.

The trends point to a greater incidence of rheumatic fever in white persons than negro. However, it seems that if the disease has been acquired by the Negro, its course is more severe than in the white and is associated more often with cardiac damage.

Syphilis over the years has stood second to hypertension as the cause of heart disease in the Negro. The incidence is changing and will continue to do so, though it continues to be more frequent than in whites. Though the incidence of syphilis has been and is greater in the negro than in the white race, there are interesting and unanswered aspects of the higher incidence of aortitis in the syphilitics of this race as against those of Caucasian origin.

As in other forms of tuberculosis the Negro suffers from a higher attack rate, as well as morbidity and mortality for tuberculous pericarditis, than do those of the white race. Subacute bacterial endocarditis is more frequently encountered in the white than in the negro race, probably as an expression of the greater incidence of rheumatic heart disease in the former. Pneumococcal endocarditis and pericarditis have always been more common in the Negro as evidence of a lower racial resistance.

Congenital heart disease seems to occur in a two to one ratio in favor of the Negro, as is true of all congenital anomalies. The terminology is so confusing relative to subendocardial fibroelastosis, idiopathic cardiac hypertrophy and related syndromes that evaluation on a racial basis is difficult. The reviewers also include a number of less frequent conditions as to racial incidence.

The authors have done a tremendous work in reviewing and summarizing over a thousand articles on the racial factors in cardiovascular disease, a work for which those interested in heart disease should be thankful.

25 YEARS AGO

Clinico-Pathologic Observations on Infantile Paralysis*

"During the Michigan infantile paralysis epidemic of 1931, 125 cases came under our observation. Eighty-one of these were first seen in the so-called systemic or pre-paralytic stage, 44 in the paralytic stage. All of the systemic cases received either convalescent poliomyelitis serum, convalescent whole blood, adult whole blood or a combination of these by the various administration routes. Four of these developed paralysis. One was not under our control and is omitted from the total number, leaving 80 treated cases for analysis. Seventy-seven of these, or 96 per cent, did not develop paralysis. In the three patients devoloping paralysis the involvement was slight, and recovery was complete at the end of one month of convalescence. No case in this series shows any paralysis today.

"Of the paralyzed cases, 27 received immunotherapy as soon as they came under observation. Nine of these (33⅓ per cent) showed definite improvement (three completely recovered); 18 cases (66⅔ per cent) showed no improvement (five died). Seventeen paralyzed cases received no immunotherapy; 12 per cent improved, 89 per cent showed marked residual paralysis.

"Criteria upon Which the Diagnosis was Based. Symptoms: Fever, headache, vomiting, diarrhea, constipation, tremor, irritability, drowsiness, sweating, disturbance of breathing and swallowing, dromedary phenomenon. Physical findings: stiff neck, stiff back with or without pain; normal hyperactive, or lost, tendon cremasteric and abdominal reflexes, spinal fluid changes (pressure, cell count and cell type, globulin mastic and colloidal gold tests); blood count. . . .

"Treatment. Twenty-one cases received immunotherapy as early as the second day, 16 the third day, 17 the fourth day, 12 the fifth and sixth days, seven the seventh and eighth days, four the ninth and tenth days, one the thirteenth day and one on the fifteenth day of the disease. Eighty-six and one-half per cent of the cases in this group received treatment between the second and sixth days of the disease. The three cases in which paralysis occurred were treated on the seventh, second and third days of the disease, respectively. One of these received 50 cc of convalescent whole blood intramuscularly; one was given a transfusion of

*Cowie, D. M., Parsons, J. P., and Lowenberg, K.: Clinico-Pathologic Observations on Infantile Paralysis: Report of 125 Acute Cases With Special Reference to the Therapeutic Use of Convalescent and Adult Blood Transfusions: The Possible Relation of Blood Group to the Severity of the Disease, Ann. Int. Med. 8:521, 1934.

125 cc of adult blood, 20 cc of convalescent serum in the muscle and 10 cc in the spine; and one received a transfusion of 175 cc of adult blood and 20 cc of convalescent serum in the vein.

"In compliance with the request of the Poliomyelitis Commission most of the cases treated outside the hospital received serum intraspinally or intravenously. Only a few of those treated in the hospital were given serum intraspinally. The dose used intraspinally varied between 6 cc and 20 cc and was given after preliminary removal of a similar amount of spinal fluid. The intravenous dose varied between 10 cc and 60 cc; the intramuscular dose between 20 cc and 50 cc. Convalescent blood transfusions were given to as many patients as possible. The amount of blood varied between 100 cc and 225 cc. Less than 150 cc was given in three cases only; 200 cc and over in 11 cases. Adult blood transfusions were given in the same amounts. One patient with bulbar symptoms, was given 325 cc of adult blood. . . .

"Our experience leads us to recommend that 20 to 30 cc of convalescent serum in the vein, 20 to 50 cc in the muscle, and a transfusion of 100 to 200 cc of convalescent or adult whole blood be given, if possible, to all definitely diagnosed systemic cases and to those in the early days of the paralysis. As large doses as possible should be given. From information gleaned from the use of serum in the prevention of experimental poliomyelitis in monkeys a concentrated serum is indicated.

"We are impressed with the great benefit that may accrue from the use of intravenous glucose, particularly in the bulbar cases, and also at times in the systemic and spinal paralytic stages. Theoretically, it should be beneficial in the pre-paralytic stage because much damage comes from edema, and because of its effect in improving volume blood flow. We have seen headache, pain, muscle tenderness and circulatory collapse relieved or caused to disappear by its use. Increasing the osmotic pressure of the blood by means of intravenous hypertonic solutions aspirates the cerebrospinal fluid from the shrinking brain tissue causing a reverse flow in the perivascular and ventricular systems. . . .

"We have recorded a study of 125 cases of epidemic poliomyelitis including data upon which our conclusions are based; 81 in the pre-paralytic stage, 44 in the paralytic stage. The cases developed in the center of the epidemic. There are also recorded a few chronic cases for purpose of discussion.

"Eighty of the pre-paralytic cases were under our complete control. They received either convalescent serum, convalescent or adult whole blood transfusion, or a combination of these by the various routes of administration. Seventy-seven, or 96 per cent, of these did not develop paralysis. In those developing paralysis, recovery was complete. No case shows any residual paralysis today.

"Twenty-seven of the paralyzed cases received immunotherapy as soon as they came under observation. Of these 33⅓ per cent showed definite improvement. Three completely recovered, five died. Seventeen paralyzed cases received no immunotherapy; 11.6 per cent improved, 86.64 per cent showed marked residual paralysis with little or no recovery.

"The progressive nature of the pathologic involvement of the central nervous system as observed clinically strongly suggests that immunotherapy and osmotherapy should also be carried on in the early stages of the paralysis. . . .

"Blood group may be an influencing factor in the severity of the disease. Seventy-seven per cent of the pre-paralytic cases fell in Types IV and III; 58 per cent of the paralyzed cases fell in Types II and I."

SOUTHERN MEDICAL NEWS

ALABAMA

Mr. Robert F. Butts, Business Manager of the Southern Medical Association, has been appointed to the President's National Committee as Director of Conference Exhibits of the 1960 White House Conference on Children and Youth. Mr. Ephraim R. Gomberg, Conference Director, made the announcement of Mr. Butts' appointment to this committee, which is a nation-wide inventory of progress in meeting the needs of the young, and expressed his deepest appreciation and gratitude to the Southern Medical Association for making his services available.

Dr. Sheridan Shirley is a newcomer to the University of Alabama Medical Center where he will be on the staff as Instructor in the Department of Surgery.

Dr. Albert E. Casey, Birmingham, has been appointed for a three year term to the State Board of Medical Technicians.

ARKANSAS

Dr. Kermit E. Krantz, Assistant Professor of Obstetrics and Gynecology, University of Arkansas Medical Center, Little Rock, has resigned to become Professor and Chairman of the Department of Obstetrics and Gynecology, University of Kansas Medical Center, Kansas City, Kansas.

DISTRICT OF COLUMBIA

Dr. Robert H. Barter, Professor of Obstetrics and Gynecology at George Washington University, made a six weeks' trip to the Far East as Consultant to the U. S. Air Force.

Dr. Stanhope Bayne-Jones, an active member of the District Medical Society, was awarded an Honorary Doctor of Science degree by Western Reserve University.

Dr. William H. Feldman, Chief of Laboratory Research in Pulmonary Diseases for the Veterans Administration in Washington, D. C., was the recipient of the 12th International Veterinary Congress Prize in 1959.

Dr. Joaquin J. Fermoselle-Bacardi was awarded a Fellowship in the American Medical Writers' Association.

Dr. Martin M. Cummings, past Director of Medical Research for the Veterans Administration in Washington, D. C., became Chairman of the Department of Microbiology at the University of Oklahoma School of Medicine in October. He will continue to be affiliated with the VA as a consultant to the agency's Oklahoma City hospital.

FLORIDA

Dr. Louis M. Orr, Orlando, President of the American Medical Association, received an honorary Fellowship in the International College of Surgeons.

Dr. Harold O. Hallstrand, South Miami, has been elected one of the Vice-Presidents of the United States Section, International College of Surgeons.

Dr. Edward W. D. Norton has been named Professor and Chairman of the Department of Ophthalmology at the University of Miami School of Medicine.

Dr. W. A. D. Anderson, Professor and Chairman of the Department of Pathology, University of Miami School of Medicine, has received the annual award of the Scientific Products Foundation for the most outstanding contribution this year to the improvement of laboratory technics. The award was made by the College of American Pathologists.

Dr. Leon S. Eisenman has been named a member of the Board of Directors of the Welfare Planning Council of Dade County representing the city of Hialeah.

GEORGIA

Dr. Robert L. Robinson, Atlanta, has been elected a member of the American Proctological Society.

Recently Dr. Sheldon B. Cohen, Atlanta, was named an Assistant Professor of Psychiatry at Emory University School of Medicine.

Dr. John E. Steinhaus, Atlanta, has been named Chairman of the Department of Anesthesiology at Emory University School of Medicine, which previously was a section of the Department of Surgery.

Dr. William A. Hopkins, Atlanta, is now serving as President of the Georgia Trudeau Society.

Newly elected officers of the State Medical Education Board are Drs. J. C. Tanner, Atlanta, Chairman, and Herman Dismuke, Ocilla, Vice-Chairman. Newly elected to the Board are the following: Drs. Lee Howard, Savannah; Luther H. Wolff, Columbus; and J. Hubert Milford, Hartwell.

KENTUCKY

Dr. Harold W. Conran, a native of Newfoundland, Canada, is a new member of the staff of Western State Hospital, Hopkinsville, where he will serve as a neurologist and psychiatrist.

President-Elect of the KSMA, Dr. Irvin Abell, Jr., Louisville, has been named as one of the five Kentucky health leaders to be members of a professional committee to select the state's 15 winners of the National Foundation's 1959 Health Scholarships.

Dr. Melvin V. Wicker, Wayland, has served 48 years as a physician in Floyd County and was named a member of the Floyd County Hall of Fame.

The Daviess County Medical Society presented Dr. F. M. Sherman, Owensboro, a gold pin for 50 years of service to the medical profession.

LOUISIANA

Dr. Lyon K. Loomis, New Orleans, has been elected to the Editorial Board of the Journal of Orthopedics.

Dr. Spencer B. McNair, New Orleans, has been elected the new President of the Civil War Round Table of New Orleans.

Dr. Joseph R. Seelig, New Orleans, represented the Louisiana Dental Association at the first national conference of the Joint Council to Improve the Health Care of the Aged recently held in Washington, D. C.

Dr. Emmanuel Farber, Associate Professor of Pathology and Biochemistry at Tulane School of Medicine, has been recently appointed for a four year term to the Editorial Advisory Board of *Cancer Research*. Dr. Farber has also been made American Cancer Society Research Professor of Pathology and Biochemistry.

MARYLAND

Dr. John C. Krantz, Jr., Professor of Pharmacology and Head of the Department at the University of Maryland School of Medicine, has been appointed a member of the National Research Council, to represent the American Society for Pharmacology and Experimental Therapeutics in the Division of Medical Sciences.

Dr. A. M. Schneidmuhl, Baltimore, has been appointed Director of the Eastern Health District Mental Hygiene Clinic for Children.

MISSISSIPPI

Dr. David G. Watson, coming from Toronto, Canada, and Dr. Darrel Smith, coming from Pennsylvania, have been named as new Assistant Professors to the Pediatric Department faculty of the Mississippi Medical Center.

The North Mississippi Community Hospital in Tupelo and the Greenwood Leflore Hospital in Greenwood were hosts for the initial sessions in a series of UMC-sponsored Circuit Courses for physicians that began in the fall.

MISSOURI

Three St. Louis Medical Society members have been named officers of the medical staff of Deaconess Hospital. They are the following: Drs. George E. Scheer, President-Elect; John J. Roth, Vice-President; and Leland E. Hosto, Secretary-Treasurer.

Dr. Albert M. Estes, Cape Girardeau, has been inducted as a Fellow of the American College of Cardiology.

Dr. Carl M. Peterson, Kansas City, has been ap-

Continued on page 72

BOOKS RECEIVED

Role of Hospitals in Ambulatory and Domiciliary Medical Care. WHO Technical Report No. 176. 32 pages. New York: Columbia University Press, 1959. Price $0.30.

WHO Chronicle. Vol. 13, No. 6, pages 239-277. New York: Columbia University Press, 1959. Price $0.30.

Resuscitation of the Unconscious Victim. By Peter Safar, M.D., and Martin C. McMahon. 79 pages. Springfield, Ill.: Charles C. Thomas, Publisher, 1959. Price $1.75.

Dictionary of Medical Slang. By J. E. Schmidt, M.D. 207 pages. Springfield, Ill.: Charles C. Thomas, Publisher, 1959. Price $6.75.

Basic Bacteriology. Its Biological and Chemical Background. By Carl Lamanna, Ph.D., Scientific Director, Naval Biological Laboratory of the School of Public Health, University of California at Berkeley; and Fran Maliette, Ph.D., Associate Professor of Agricultural and Biological Chemistry, The Pennsylvania State University. Second edition. 835 pages. Baltimore: The Williams & Wilkins Company, 1959. Price $13.50.

Basic Physics in Radiology. By L. A. W. Kemp, B.Sc., Ph.D., F. Inst. P., Chief Physicist to the London Hospital; and R. Oliver, M.Sc., F. Inst. P., A.M.I.E.E., Principal Physicist in the Department of Radiotherapy of the United Oxford Hospitals. 316 pages. Springfield, Ill.: Charles C. Thomas, Publisher, 1959. Price $8.50.

The Kinetics of Cellular Proliferation. Edited by Frederick Stohlman, Jr., M.D. Proceedings of a Conference held in January, 1959. 446 pages. New York: Grune & Stratton, 1959. Price $5.75.

Automatic Ventilation of the Lungs. By William W. Mushin, M.A., M.B., B.S., F.F.A.R.C.S., F.F.A.R.A.C.S., Professor of Anaesthetics, Welsh National School of Medicine, University of Wales; L. Rendell-Baker, M.B., B.S., F.F.A.R.C.S., Assistant Professor of Anaesthesia, Western Reserve University School of Medicine, Cleveland, Ohio; and Peter W. Thompson, B.A., M.B., B. Chir., F.F.A.R.C.S., Consultant Anaesthetist, United Cardiff Hospitals, and Welsh Regional Hospital Board. 334 pages. Springfield, Ill.: Charles C. Thomas, Publisher, 1959. Price $10.50.

What Next, Doctor Peck? By Joseph H. Peck, M.D. 209 pages. New York: Prentice-Hall, Inc., 1959. Price $3.50.

Clark's Applied Pharmacology. By Andrew Wilson, M.D., Professor of Pharmacology and General Therapeutics, University of Liverpool; and H. O. Schild, M.D., Reader in Pharmacology in the University of London at University College. 720 pages, 165 illustrations. Boston: Little, Brown and Co., 1959. Price $10.00.

Synopsis of Ear, Nose, and Throat Diseases. By Robert E. Ryan, M.D., Department of Otolaryngology, St. Louis University School of Medicine; William C. Thornell, M.D., Assistant Professor, Department of Otolaryngology, Cincinnati College of Medicine; and Hans von Leden, M.D., Assistant Professor of Otolaryngology, Northwestern University Medical School. 369 pages. St. Louis: The C. V. Mosby Company, 1959. Price $6.75.

Chemical Quantitation of Epinephrine and Norepinephrine in Plasma. By William M. Manger, M.D., Department of Medicine, College of Physicians and Surgeons, New York City; Khalil G. Wakim, M.D., Section of Physiology; and Jesse L. Bollman, M.D., Section of Biochemistry, Mayo Clinic. 354 pages. Springfield, Ill.: Charles C. Thomas, Publisher, 1959. Price $11.50.

The Care of Minor Hand Injuries. By Adrian E. Flatt, M.D., Assistant Professor of Orthopedic Surgery, State University of Iowa. 260 pages, illustrated. St. Louis: The C. V. Mosby Company, 1959. Price $9.50.

Anesthesiology for Infants and Children. By Robert M. Smith, M.D., Anesthesiologist, The Children's Medical Center, Boston, Mass. 409 pages, 182 illustrations. St. Louis: The C. V. Mosby Company, 1959. Price $12.00.

The Physiology of the Newborn Infant. By Clement A. Smith, M.D., Associate Professor of Pediatrics, Boston Lying-in Hospital, Harvard Medical School. Third edition. 485 pages. Springfield, Ill.: Charles C. Thomas, Publisher, 1959. Price $12.50.

Preventive Aspects in the Teaching of Pathology. WHO Technical Report Series No. 175. 30 pages. New York: Columbia University Press, 1959. Price $0.30.

Iron Deficiency Anaemia. World Health Organization Technical Report Series No. 182. 15 pages. New York: Columbia University Press, 1959. Price $0.50.

Early Diagnosis. Edited by Henry Miller, M.D., F.R.C.P., Physician in Neurology, Royal Victoria Infirmary, Newcastle upon Tyne. 375 pages. Baltimore: The Williams & Wilkins Co., 1959. Price $6.50.

Diseases of Medical Progress. By Robert H. Moser, M.D., Associate Professor of Internal Medicine, Graduate School, Baylor University. 116 pages. Springfield, Ill.: Charles C. Thomas, Publisher, 1959. Price $4.75.

Recent Progress in Oxytocin Research. By B. Berde, M.D., Pharmacological Laboratory, Sandoz Ltd., Basle, Switzerland. American Lecture Series, 106 pages. Springfield, Ill.: Charles C. Thomas, Publisher, 1959. Price $4.75.

Combined Textbook of Obstetrics and Gynaecology. Edited by Dougald Baird, B.S., M.D., D.P.H., F.R.C.O.G., Regius Professor of Midwifery, University of Aberdeen, Gynaecologist, Aberdeen Royal Infirmary. Sixth edition. 906 pages, 492 illustrations. Baltimore: The Williams & Wilkins Co., 1959. Price $15.00.

Swire's Handbook for the Assistant Nurse. Edited and revised by Ruby Thora Farnol, Examiner to the General Nursing Council of England and Wales. 331 pages. Baltimore: The Williams & Wilkins Co., 1959. Price $4.00.

A Synopsis of Anaesthesia. By J. Alfred Lee, M.R.C.S., L.R.C.P., M.M.S.A., F.F.A.R.C.S., D.A., Senior Consultant Anaesthetist to the Southend-on-Sea Hospital. Fourth edition. 578 pages, 72 illustrations. Baltimore: The Williams & Wilkins Co., 1959. Price $6.50.

A Synopsis of Skin Diseases. By Bethel Solmons, Jun. M.A., M.D., F.R.C.P.I., Consultant Dermatologist, Chelmsford and Essex General Hospital. 272 pages. Baltimore: The Williams & Wilkins Co., 1959. Price $6.75.

Synopsis of Ophthalmology. By William H. Havener, M.D., Professor and Chairman, Department of Ophthalmology, Ohio State University. 282 pages, 189 illustrations. St. Louis: The C. V. Mosby Co., 1959. Price $6.75.

INSTRUCTIONS TO CONTRIBUTORS

Exclusive Publication: Articles offered for publication must be contributed solely to the Southern Medical Journal.

Manuscripts: Manuscripts should be original copy, typewritten, double-spaced, with wide margins. Because of lack of space, it is necessary to limit the number of bibliographic references to twenty. Footnotes and references should conform to the following style:

1. Doe, J. E.: What You Should Know about It, New England J. Med. 243:435, 1950.

Illustrations: Black and white glossy prints, preferably 5 by 7 inches, and drawings in India ink on white paper are required. The author's name, number and indication of top, if doubtful, should be attached. Necessary plates not exceeding six, or one and a half pages, will be furnished by the Journal.

Reprints: Reprints are available at publisher's cost. An order form will accompany author's galley proof and should be returned with the galley to the Editor.

Book Reviews: Books and monographs submitted for review should be mailed to the Editor. Acknowledgment will appear in the Journal. Selection rights reserved.

Editorial Address: All manuscripts, corrected galley proof, reprint orders, books for review and related correspondence should be addressed to the Editor, R. H. Kampmeier, M.D., Vanderbilt University School of Medicine, Nashville 5, Tennessee.

Business Address: All correspondence related to membership, subscriptions, advertising, and other business should be addressed to the Southern Medical Association, 2601 Highland Avenue, Birmingham 5, Alabama.

BOOK REVIEWS

Clinical Radiology of Acute Abdominal Disorders

By Bernard S. Epstein, M.D., Associate Clinical Professor of Radiology, Albert Einstein College of Medicine, N. Y. 327 pages, with 406 illustrations on 224 figures. Philadelphia: Lea & Febiger, 1958. Price $15.00.

This volume covers practically all of the conditions which radiologists are concerned with in the digestive tract and other abdominal organs and parts other than the genitourinary system. Most of the material concerns conditions which produce more or less acute abdominal symptoms. The four major subdivisions are congenital disorders; neoplastic diseases; inflammatory, collagen, metabolic and vascular conditions; and traumatic conditions, foreign bodies and effect of drugs. The material is very well organized with brief, concise descriptions of the conditions, some of the symptomatology and the significant radiologic findings. Each specific condition is surveyed in quite broad clinical fashion which includes a good but brief summary of the usual symptomatology, clinical findings and differential radiological signs associated.

At the end of each discussion are given excellent references for additional reading on the particular subject.

The book thus serves as a useful tool for quick reference, as well as an immediate source of most valuable references for more extensive reading.

Lesions of the Lower Bowel

By Raymond J. Jackman, M.D., Associate Professor of Proctology, Mayo Foundation, University of Minnesota, Rochester, Minnesota. 337 pages. Springfield, Ill.: Charles C. Thomas, Publisher, 1958. Price $15.00.

The recently published volume on *Diseases of the Lower Bowel* written by Raymond Jackman is based on the very extensive experience of the Mayo Clinic's Proctology Section of which he is the head.

The book is concerned primarily with the diagnosis and differential diagnosis of diseases of the distal portion of the large intestine, while very little discussion is devoted to surgical management and technic.

The author devotes one chapter to the details of transrectal needle biopsy of intramural and extrarectal tumors. The various diagnostic procedures indicated for the characteristic findings of both the common and rare lower bowel lesions are well described and illustrated. Anorectal sinuses, fistulae, prolapse, diverticular disease, ulcerative colitis, polyps and carcinoma are some of the conditions discussed. The color atlas with its 75 plates is a most impressive part of the book.

This volume will be a most valuable addition to the library of any physician who deals in any way with diseases of the bowel.

Intracranial Calcification

By Fermo Mascherpa, Chief of X-ray Department, Milan Neurological Institute, Milan, Italy; and Vincenzo Valentino, Radiologist of the Institute of Semeiological Medicine, Naples, Italy. 139 pages. Springfield, Ill.: Charles C. Thomas, Publisher, 1959. Price $9.50.

This monograph reviews extensively the subject of nonpathologic and pathologic intracranial calcification. It is profusely illustrated and most of these illustrations are of excellent quality. The literature on the subject is critically discussed, and the bibliography includes all of the relevant references. This work will be of interest to radiologists, neurologists, and neurosurgeons. It is a recommended acquistion for all medical libraries.

Constitution and By-Laws,* Southern Medical Association

CONSTITUTION

ARTICLE 1—NAME

The name and title of this organization shall be the SOUTHERN MEDICAL ASSOCIATION (a nonprofit organization) chartered under the laws of the State of Alabama, and its domicile shall be in Birmingham, Alabama.

ARTICLE 2—PURPOSE

The exclusive purpose of this Association shall be to develop and foster scientific medicine. It shall have no direct connection with or control over any other society or organization, nor shall it at any time be controlled by any other society or organization. All meetings of the Association shall be for the sole purpose of reading and discussing papers pertaining to the science of medicine, to public health and to medical education. The Association shall not at any time take active part in any economic, political or sectarian questions, or concerted movements for securing legislative enactments.

ARTICLE 3—MEMBERSHIP

Section 1. *Members.* The membership of this Association shall be limited to the white members of the various state and local medical societies of the following states, viz.: Alabama, Arkansas, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia; to white medical officers of the United States Army, Navy, Public Health Service and Veterans' Bureau on active duty and to white American members of the Canal Zone Medical Association and the Puerto Rico Medical Association.

Section 2. *Honorary Members.* An active member of this Association who has been a member for a period of not less than ten consecutive years and who is an honorary member of his component society and of his constituent association, or who by reason of ill health or physical disability or who because of eminence attained in the profession, may at the discretion of the Council be recommended for honorary membership. Such honorary members shall have all the rights and privileges of membership except that they may not hold office nor shall they be required to pay dues.

Section 3. *Associate Members.* The Association may have three classes of associate members: (1) a layman who has rendered meritorious service to the medical profession or to humanity, (2) a member who has moved from the territory of the Southern Medical Association, and (3) persons not hold-

*January 1, 1959

ing a degree of doctor of medicine but who are on the teaching staff of a medical school or engaged in research, practice or promotion of a science allied to medicine and holding a degree in a subject commonly referred to as a basic science. To be eligible for associate membership under Class 3 a person must satisfy the requirements as set forth in Section 1 except for holding membership in state or local societies. Classes 1 and 2 may be recommended to associate membership by the Council. They shall not hold office, have no voice in the affairs of the Association or pay annual dues and therefore will not be eligible to receive the SOUTHERN MEDICAL JOURNAL. Class 3 may be accepted for associate membership by the Association office after their eligibility under the provisions of this Section has been determined. They shall pay the regular annual dues and receive the SOUTHERN MEDICAL JOURNAL but shall not hold office nor have a voice in the affairs of the Association.

ARTICLE 4—SCIENTIFIC WORK

The scientific work of this Association shall be divided into twenty sections: Section on General Practice, Section on Medicine, Section on Gastroenterology, Section on Neurology and Psychiatry, Section on Pediatrics, Section on Pathology, Section on Radiology, Section on Dermatology and Syphilology, Section on Allergy, Section on Physical Medicine and Rehabilitation, Section on Industrial Medicine and Surgery, Section on Surgery, Section on Orthopedic and Traumatic Surgery, Section on Gynecology, Section on Obstetrics, Section on Urology, Section on Proctology, Section on Ophthalmology and Otolaryngology, Section on Anesthesiology, and Section on Public Health; and such other sections as the Association may from time to time create or provide for.

ARTICLE 5—ANNUAL MEETING

Section 1. The Association shall hold an annual meeting during which there shall be not less than two general sessions, one of which may be devoted to the business of the Association and restricted exclusively to the membership when so determined by the Council or by the Executive Committee or upon a petition filed by not less than twenty-five members of the Association. All expenses of the annual meeting shall be borne by the Association.

Section 2. The time and place for holding each annual meeting shall be fixed by the Council.

Section 3. Persons of distinguished scientific attainments, not members of this Association, may become guests during any annual session, and shall be accorded the privilege of participating in all of the discussion. The privilege of the floor cannot be otherwise extended except by unanimous affirmative vote of the members present.

ARTICLE 6—OFFICERS

Section 1. The officers of the Association shall be a President, President-Elect, First Vice-President, Second Vice-President, a Board of Trustees, and a Council composed of one member from each state or district of the Association. An Executive Secretary, a Business Manager, a Treasurer, and an Editor of the Journal, shall be selected by and with the consent of the Council, with salaries and tenure of office to be determined by the Council.

Section 2. All elective officers of the Association except the Trustees and Councilors shall be elected annually at the last general session.

Section 3. The Councilors shall be appointed by the President, one from each of the states enumerated in Article 3, Section 1, and shall serve for five years, and shall not be eligible for reappointment, the Councilor terms expiring with the close of annual meetings. This Section shall become effective as of 1933, the Councilor terms to expire as follows: 1933, Louisiana, Mississippi, Oklahoma; 1934, Arkansas, Georgia, District of Columbia; 1935, Florida, South Carolina, Virginia, Texas; 1936, Maryland, Missouri, North Carolina; 1937, Alabama, Tennessee, West Virginia, Kentucky.

Section 4. The Trustees shall be six in number and shall be elected by the Council, one each year, to serve for a period of six years. The oldest member in point of service shall be the Chairman.

ARTICLE 7—SECTION OFFICERS

The officers of each Section shall consist of a Chairman, Vice-Chairman and Secretary, and when so desired by the Section, a Chairman-Elect as an additional officer or in place of the Vice-Chairman, elected annually by the members of the respective Sections. The chairmen and secretaries of all sections shall meet with the President and Secretary at each annual meeting at a time to be fixed by the President.

ARTICLE 8—SEAL

The Association shall have a common seal, with power to break, change or renew the same at pleasure.

ARTICLE 9—AMENDMENTS

The Association may at any annual meeting amend any article of this Constitution by a two-thirds affirmative vote of the members present and voting at a general session of that meeting, provided the amendment has been presented in writing and laid on the table at the previous annual meeting.

BY-LAWS

CHAPTER 1—MEMBERSHIP

Section 1. Any member who is under sentence of suspension or expulsion from his state or local society shall automatically forfeit his membership in this Association.

Section 2. Each member in attendance at the annual meeting shall register and shall receive a badge, which shall be evidence of his right to all the privileges of membership at that meeting. No member shall take part in any of the proceedings of an annual meeting until he has complied with the provisions of this Section.

Section 3. The Association may at any annual meeting on recommendation of Council suspend or expel any member of the Association by a majority vote of those present at the last general session of that meeting.

Section 4. Application for membership in this Association shall be made in writing.

Section 5. The Association reserves the right to accept or reject any application for membership.

CHAPTER 2—GENERAL SESSIONS

Section 1. The general sessions shall include all registered members and eligible guests who shall have equal rights to participate in the proceedings and discussion and, except guests, to vote on prevailing questions. Each session shall be presided over by the President, or, in his absence or inability or by his request, by the First or Second Vice-President. Three general sessions may be held at each annual meeting, but one of these shall be on the first day and open the annual meeting of the Association and be restricted to the membership and largely to a discussion of the business of the Association, and another on the third evening at which time the President's address, other addresses, the report of the Council, of officers and committees, will make up the order of business for the final session.

Section 2. The general sessions shall have authority to create committees or commissions for scientific investigations of special interest and importance to the profession and public, and to receive and dispose of reports of the same; but any expense in connection therewith must first be concurred in by the Association.

Section 3. Except by special order, the order of exercise, papers and discussions as set forth in the official program shall be followed from day to day until it has been completed, and all papers omitted will be recalled in regular order.

Section 4. No address or paper before the Association, or any of its sections, except the address of the President and orators shall occupy more than twenty minutes in its delivery; and no member shall speak longer than five minutes, nor more than one time on any subject, provided each essayist be allowed five minutes in which to close the discussion.

Section 5. All papers read before the Association or any of its sections shall be the property of the Association. Each paper shall be deposited with the Secretary of the section when read.

CHAPTER 3—ELECTION OF OFFICERS

Section 1. All elections shall be by secret ballot, by open ballot, by viva voce or standing vote, as the

majority of those present may elect. A majority of the votes cast shall be necessary to elect.

Section 2. In balloting for the nominees for the various offices, if no one receives a majority of the votes cast the number receiving the smallest number of votes shall be dropped and the balloting shall proceed in this manner until an election shall be declared.

Section 3. The report of the Council as the Board of Censors and the Executive Committee of this Association shall be presented at the last general session.

Section 4. There shall be a Selection Committee of the Council consisting of five members from the Council appointed by the Chairman of the Council and announced at the January meeting of the Executive Committee. One member shall represent each class with the oldest member in point of service acting as Chairman. It shall be the duty of this Committee to seek, receive and consider names for all elective offices. After due consideration, a list of nominees shall be submitted to the Council for nomination as prescribed already in the Constitution and By-Laws. The submission of such a list does not preclude nominations from the floor. The results of these nominations along with the report of the Council and the election of officers shall be submitted to the general membership as the final order of business at the last general session.

Section 5. The election of section officers shall be at the last session of the sections.

CHAPTER 4—Duties of Officers

Section 1. The President shall preside at all general sessions of the annual meetings and all functions at which the Association is host. He shall appoint all committees not otherwise arranged for, shall deliver an annual address at a general session to be held at a time to be decided upon by the Executive Committee, shall cast a deciding vote in case of a tie, and shall perform such other duties as the definition of his office, custom and parliamentary usage requires. The program for the general sessions shall be formulated by the President.

Section 2. The First Vice-President shall assist the President in the discharge of his duties and in the event of his death, resignation, or removal, shall succeed him. He shall also perform such other duties as may be assigned to him under the Constitution and By-Laws.

Section 3. The Second Vice-President shall be *ex officio* a member of the Committee on Meeting Places.

Section 4. The Executive Secretary shall be the chief administrative officer of the Association. His special areas of responsibility shall be: (a) Supervision of Employees—He shall employ and direct all staff personnel (full and part-time) including the assignment of duties of such employees except the staff employees under the direct supervision of the Business Manager, the Editor, the Advisor and Professional Relations Counselor and other administrative officers. (b) Promotion and Records—With the cooperation of the Advisor and Professional Relations Counselor and other Officers, he shall seek at all times to expand the membership and interests of the Association. He shall keep, or cause to be kept, the official minutes of the transactions of the Association as the Council may direct, and not otherwise provided. He shall conduct the official correspondence and shall be the custodian of all official records and papers of the Association. (c) Director of Finance and Budgetary Control—As chief finance officer of the Association, he shall receive all funds, including bequests and donations, and deposit the same to the credit of the Treasurer or to other officially designated Funds or Accounts. He shall direct the general bookkeeping and accounting system and shall render an annual financial report to the Council. He shall prepare and recommend an annual budget to the Council. Said budget, when amended and adopted by the Council, shall determine the expenditure of funds during the ensuing fiscal year, and shall not be amended without the approval of the Council. All expenses of the Association shall be paid by check signed by the Executive Secretary, either as the original signature, or as a counter-signature as directed by the Council. He shall secure an annual audit of the books of account by a certified public accountant, approved by the Council, which audit report shall be transmitted to the Council as a part of his financial report. He shall be bonded in favor of the Association in an amount determined by the Council, with the premium cost of such bond to be paid by the Association. (d) Director of Scientific Exhibits—He shall plan and direct the scientific exhibits for the annual sessions. All proposed exhibits shall be approved by the Editor or such other committee or agency designated by the Council in order to secure professional and educational evaluation prior to the sessions. (e) Managing Editor of the Journal—He shall act as managing editor of the Southern Medical Journal and other publications of the Association. (f) Delegation of Authority—He may delegate to the Business Manager, by and with his consent, or to staff personnel any portions of the above responsibilities.

Section 5. The Business Manager shall be responsible directly to the Council, with the understanding that at all times his work shall be co-ordinated with that of the Executive Secretary. He with the Executive Secretary shall plan and direct all activities related to the production of revenue for the Association. His special areas of responsibility shall be: (a) Business Management of the Journal and other Publications—He shall have active direction of the business affairs of the Journal including (1) establishing and maintaining advertising policies, subject to the prior approval of the Editor or any committee or agency so designated by the Council, (2) securing advertising, (3) executing and enforcing contracts for printing, and supervising production of the Journal. (b) Director of Technical Exhibits—He shall plan and direct the technical exhibits for the annual sessions in accordance with basic policy established by the Council or Executive Committee. (c) Physical Facilities for Annual Sessions—He shall secure necessary facilities for holding the annual sessions; executing necessary contracts and agreements for proper and adequate space, and shall advise the Executive Secretary and the Council with respect to the availability of adequate facilities for the annual sessions within the territory. (d) Supervision of Employees—He shall employ and direct the full and part-time staff personnel under his immediate supervision. (e) Acceptance of Other Responsibility—At the request of the Executive Secretary, and/or Council, he shall take responsibility for other personnel and duties.

Section 6. The offices of Executive Secretary and Treasurer may be combined and vested in the same person at the discretion of the Council. If the offices be separate, the Treasurer shall be elected by the Council which shall determine his compensation and tenure of office. He shall give bond in an amount determined by the Council, with the premium of said bond to be paid by the Association. He shall receive all funds from the Executive Secretary and deposit the same in a bank or banks located in the domicile of the Association. Such depositories shall be designated by and with the consent of the Council. He shall sign all checks drawn on the Association for sums provided for in the annual budget. If the offices of Executive Secretary and Treasurer are vested in the same person, then the Executive Secretary-Treasurer shall perform the duties of the Treasurer herein defined.

Section 7. The Council, at its discretion, may elect an Advisor and Professional Relations Counselor to actively serve the Association under the direction of the Council. His compensation, tenure of office, and specific responsibilities shall be determined by the Council. Proper and adequate budgetary allowances shall be made in the regular budget submitted annually to the Council for adoption, said allowances to include salaries, rent, travel expense, supplies and other reasonable expenses incident to the performance of his duties as designated by the Council. He shall submit an annual report of his activities to the Council.

Section 8. The Editor. (a) He shall be responsible for the non-advertising portion of the Journal, including (1) the preparation of editorials, (2) the selection and editing of scientific articles, (3) the sectional content, and (4) the general format with approval of the Executive Secretary and Business Manager. (b) He may appoint, by and with the consent of the Council, assistant or associate editors and/or an Editorial Board. (c) He will review, or cause to be reviewed, any books which in his discretion merit the publication of a review in the Journal. (d) By and with the consent of the Executive Secretary (acting as Managing Editor), he shall establish practical mechanics for handling manuscripts and other materials for publication. (e) He may, with the consent of the Council, employ necessary secretarial assistance.

CHAPTER 5—Council

Section 1. The Council shall hold sessions as seem necessary during the annual meeting of the Association, and at such other time as necessity may require, subject to the call of the Chairman or on petition of three Councilors. It shall hold a session on the first day of the annual meeting of the Association. At each annual meeting a Chairman for the succeeding year shall be elected. It shall, through its Chairman, make an annual report to the Association at such time as may be provided for.

Section 2. Collectively, the Council shall be the Board of Censors and Governing Body of the Association. It shall have jurisdiction over all questions involving the rights and standings of members, whether in relation to other members or to this Association. All matters brought before the general sessions or sections shall be referred to the Council without discussion, provided that all conclusions, recommendations and findings of the Council must be approved by a majority vote of the members present at the general session before which the Report of Council shall be presented.

Section 3. In the event of any regularly appointed Councilor being unable to attend the annual meeting, the President shall appoint an alternate to serve for that meeting.

Section 4. The Council shall constitute the Nominating Committee for all elective offices except the section officers and shall report the results of its deliberations to the last general session. It shall include nominations for such offices as are to be filled at that annual meeting. Members of the Council are not eligible to any of the offices nominated by them. Nothing in this section shall be construed as preventing additional nominations being made on the floor by members of the Association.

Section 5. There shall be an Executive Committee of the Council to represent the Association and Council between the annual meetings to consider special matters as would come before the Council and report their findings and conclusions to the Council. Any matters of such urgency that they should not wait over until the annual meeting are to be presented to the Council in the most effective means and a vote taken on their recommendations by the most expeditious means. A majority of replies received within ten days will determine the action of the Council. The Executive Committee shall consist of seven members: the Chairman of the Council, the Vice-Chairman of the Council, three other members of the Council elected annually by the Council, the President of the Association and the President-elect. The Chairman of the Council shall serve as Chairman of the Executive Committee. In event of the absence of a Council member of this Executive Committee, an alternate may be appointed by the Chairman to meet during the respective session, with full power of the absent member. The Executive Committee may meet as often and at such places as the Chairman or four members of the Executive Committee may decide, except that one meeting each year must be held at the home office in Birmingham. This committee will be the Advisory Committee to the Woman's Auxiliary. All expenses of this Committee attending meetings other than the annual meetings shall be borne by the Association. The Executive Committee shall serve as a Finance Committee to work with the Executive Secretary in budget studies, and in supervising the carrying out of the annual budget; and shall consider all unappropriated or unbudgeted expenses before such items are considered by the Council.

CHAPTER 6—Duty of Trustees

Section 1. The legal title to all property of the Association shall vest in the Trustees and their successors in office. They shall execute all deeds of conveyance of property, both real and personal, when authorized to do so by the Council, and shall see that all property is insured and taxes paid thereon, and shall be reimbursed for such expenditures by the Treasurer, on warrants properly authorized by the Council. Any action authorized to be done by the Trustees within the limitations of this section shall be binding if done by a majority thereof.

CHAPTER 7—Committees

Section 1. There shall be Committees on Convention Arrangements, Publications, Scientific Exhibits, Research and such other committees as the President or the Council may decree necessary. There shall be appointed annually by the President, on nominations by the respective Councilor, five associate Councilors from each state or district plus the respective Councilor as Chairman. Such Councilor committee shall stimulate interest in all activities of the Southern Medical Association.

Section 2. The Committee on Arrangements shall be appointed by the President after consultation with the president of the host society and the Secretary of the Association. The Secretary shall report to the President and Chairman of the Council each month the progress made in arranging for the annual meeting.

Section 3. A secret committee on awards for scientific exhibits shall consist of five members and shall be appointed by the Chairman of the Council. One member shall represent pathology, one medicine, one surgery and two at large. One member shall be a member of the Council and he shall be the Chairman of this Committee. The following standards are to be followed in making awards: (1) originality, (2) practicability, (3) applicability to practice of medicine, (4) quality, (5) teaching value, (6) quantity, and (7) personal demonstration. The committee shall select the three outstanding exhibits and report to the Council at its final meeting. A certificate of merit signed by the President and Chairman of the Council will be presented to the three best exhibitors at the final session of the convention and shall be designated first, second and third.

Section 4. There shall be a Distinguished Service Award of the Association which shall be awarded annually to any member in recognition of outstanding contributions to the advancement of medical science. Any member of the Association shall be eligible to receive the award and nominations may be made by any member of the Association.

An unpublicized committee of at least five members with the First Vice-President as Chairman to be known as the Committee on the Distinguished Service Award shall be appointed by the President to canvass and evaluate the work of the various nominees and shall submit the names of three nominees to the Council which shall elect one of the three as the recipient of the award, to be publicly presented at the last general session of that meeting.

Section 5. There shall be a Research Medal which may be awarded from time to time to a member of the Southern Medical Association for meritorious and original research work provided the member has made contributions to medical science of sufficient importance to merit this distinction; the Council to provide for a proper committee to evaluate research work and report to the Council.

CHAPTER 8—Dues

Section 1. Effective as of January 1, 1951, as per action of the Association on November 14, 1950, the dues of this Association shall be $10.00 per year, payable annually in advance, membership to begin on date of application.

Section 2. Any member whose dues shall remain unpaid for six months shall be automatically suspended at the end of six months, provided that on full payment of his arrearage he shall be automatically reinstated as a member in good standing from the date of reinstatement.

CHAPTER 9—Fiscal Year

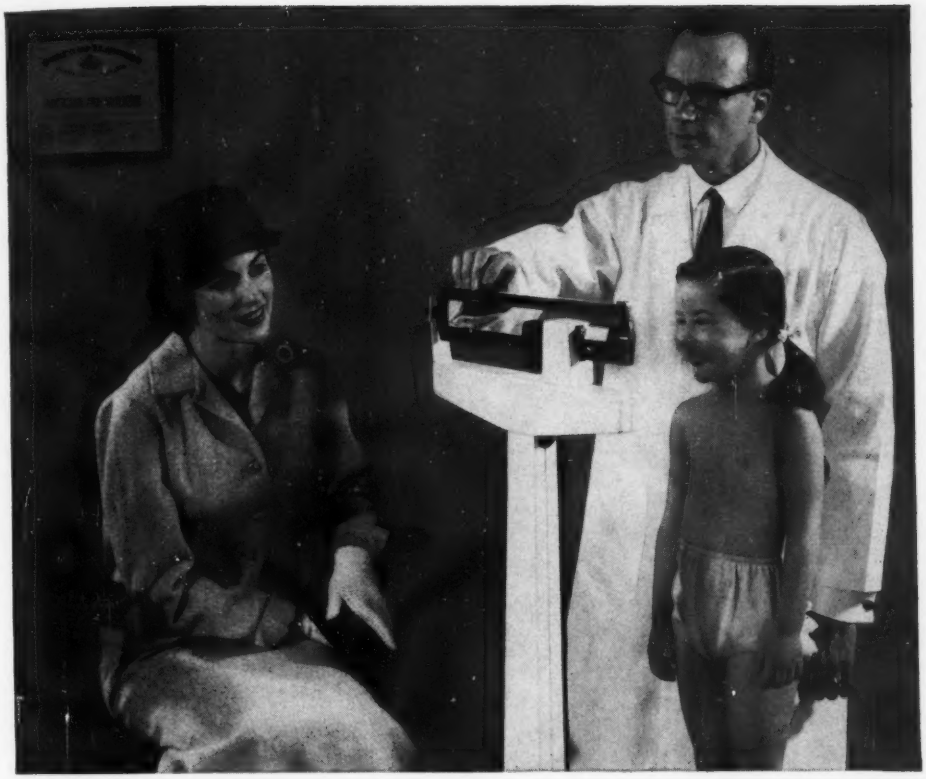
The fiscal year shall be October 1 to September 30.

CHAPTER 10—Rules of Order

The deliberations of this Association shall be governed by parliamentary usage, as contained in Roberts' "Rules of Order."

CHAPTER 11—Amendments

These By-Laws may be amended at any annual meeting by a two-thirds affirmative vote of the members present and voting at a general session of that meeting after the amendment has been presented in writing and laid on the table for one day.



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A highly important feature of the weight gain thus produced is that it is not ordinarily manifested by deposition of fat but as muscle tissue resulting from the protein anabolism induced by Nilevar.

Anorexia and "Weight Lag" Study—Brown, Libo and Nussbaum have reported* consistent and definite increases in rate of weight gain in eighty-six patients, ranging in age from 7 weeks to 15½ years. This beneficial action of Nilevar was observed in the patients with organic and traumatic disorders as well as those whose only complaints were poor appetite and/or persistent failure to gain weight.

In this study, the weight gained was not lost after discontinuance of Nilevar therapy although many patients did not continue the sharp gains effected by the drug.

The authors are of the opinion that Nilevar is a highly useful anabolic agent for influencing weight gain in underweight children.

When Nilevar is administered to children a dose of 0.25 mg. per pound of body weight is recommended and continuous dosage for more than three months is not recommended.

Nilevar is supplied as tablets of 10 mg., drops of 0.25 mg. per drop and ampuls of 25 mg. in 1 cc. of sesame oil. Further dosage information in Searle Reference Manual No. 4.

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Research in the Service of Medicine.

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*Brown, S. S.; Libo, H. W., and Nussbaum, A. H.: Norethandrolone in the Successful Management of Anorexia and "Weight Lag" in Children, Scientific Exhibit presented at the Annual Meeting of the American Academy of Pediatrics, Chicago, Oct. 20-23, 1958.

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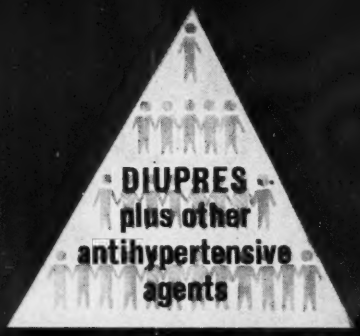

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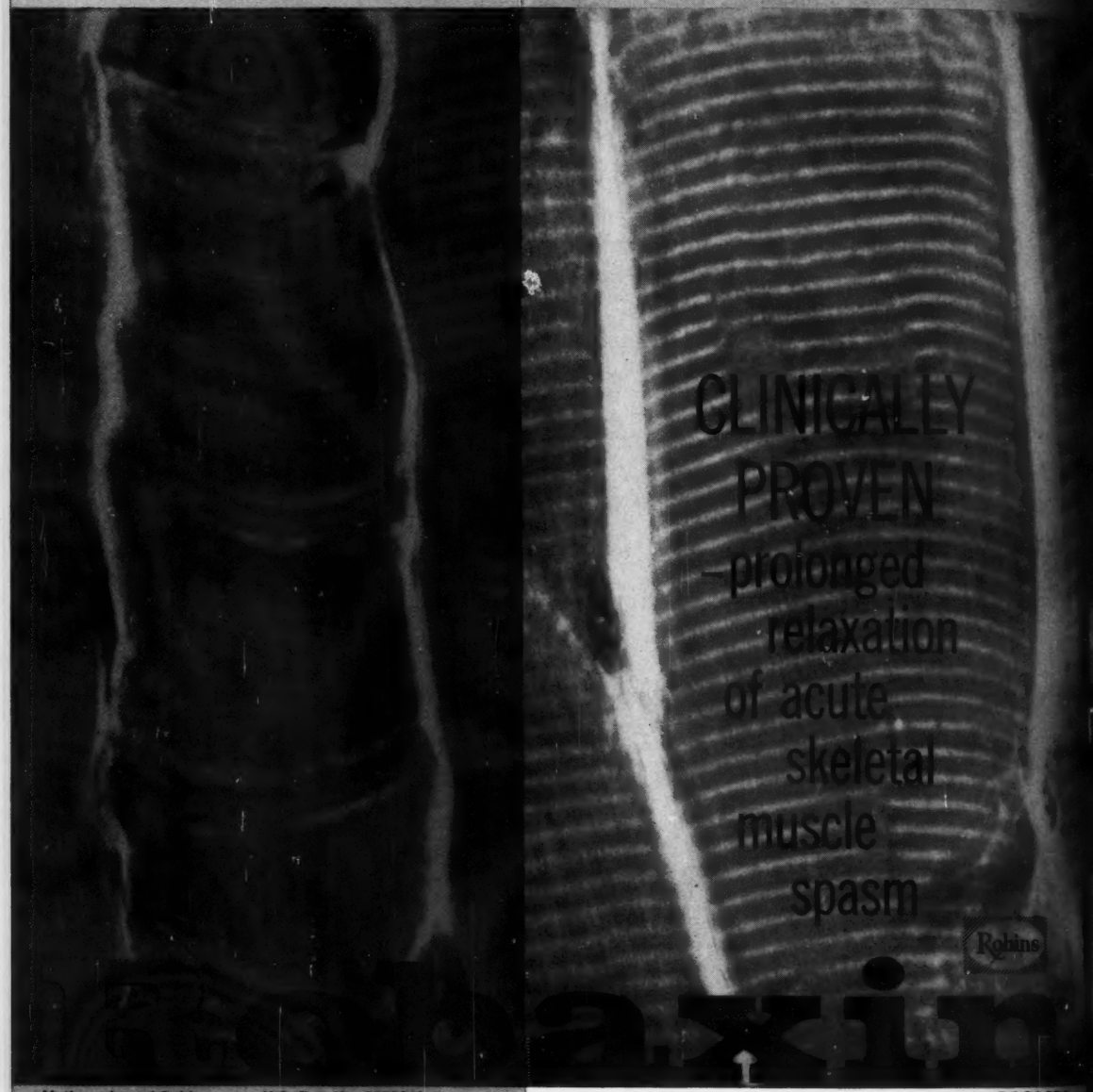
Fiber of skeletal muscle in spasm

Fiber of skeletal muscle relaxed *(photomicrographs)*



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ROBAXIN BENEFICIAL IN 92.4% OF SKELETAL MUSCLE SPASM CASES

	NO. PATIENTS	RESPONSE			
		"marked"	moderate	slight	none
Carpenter[1]	33	26	6	1	—
		"pronounced"			
Forsyth[2]	58	37	20	—	1
		"good"			
Lewis[3]	38	25	6	—	7
O'Doherty & Shields[4]	17	"excellent" 14	2	1	0
		"significant"			
Park[5]	30	27	—	2	1
		"gratifying"			
Plumb[6]	60	55	—	—	5
TOTALS	236	184 (78.0%)	34 (14.4%)	4	14

- **Highly potent—and long acting.**[1,2,3]
- **Relatively free of adverse side effects.**[1,2,3,5,6]
- **In ordinary dosage, does not reduce muscle strength or reflex activity.**[1]

REFERENCES: 1. Carpenter, E. B.: Southern M. J. 51:627, 1958. 2. Forsyth, H. F.: J.A.M.A. 167:163, 1958. 3. Lewis, W. B.: California Med. 90:26, 1959. 4. O'Doherty, D. S., and Shields, C. D.: J.A.M.A. 167:160, 1958. 5. Park, H. W.: J.A.M.A. 167:168, 1958. 6. Plumb, C. S.: Journal-Lancet 78:531, 1958.

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With BUTISOL there is no personality distortion or indifference to responsibilities.

1. Grossman, A. J.; Batterman, R. C., and Leifer, P.: Fed. Proc. 17:373 (March) 1958.

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Quiets the cough
Relieves allergy-caused congestion
Liquefies mucus and facilitates expectoration
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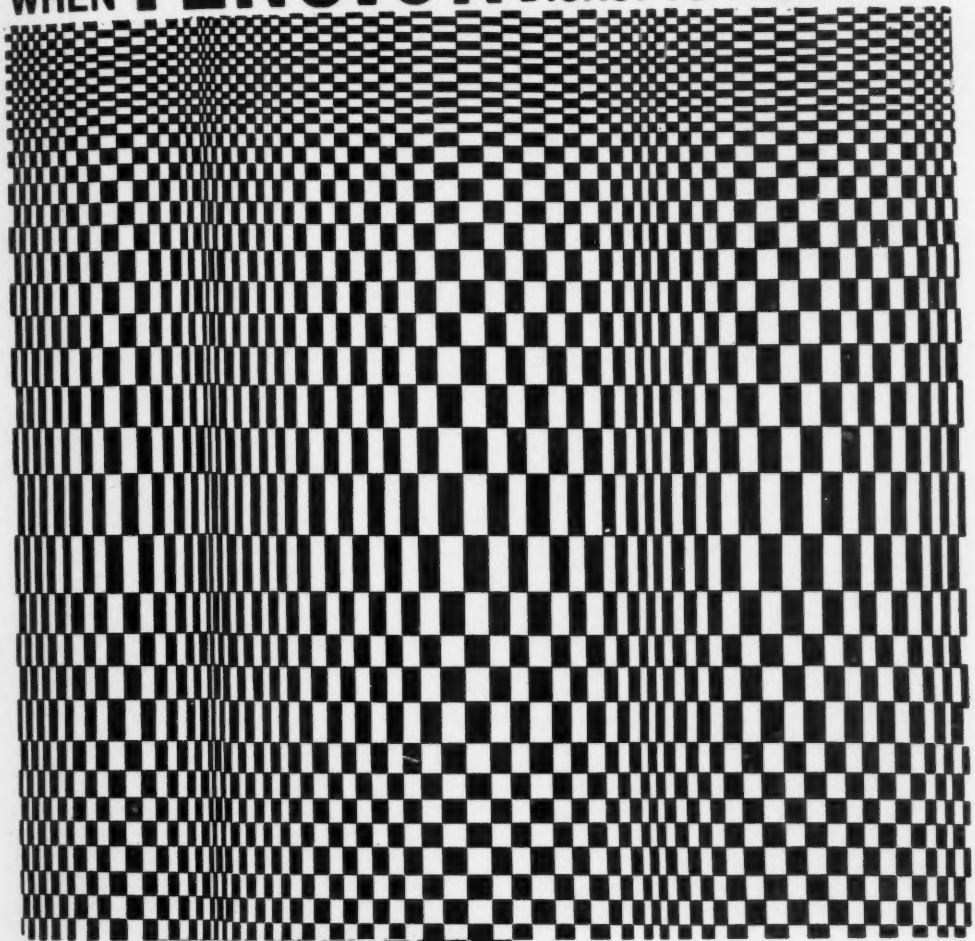
WHEN TENSION DISRUPTS TREATMENT



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1. Innerfield, I.: Clinical report cited with permission
2. Clinical report cited with permission

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LACERATION
marked reversal
in 3 days...
returned
to school...
closure advanced[1]

THROMBOPHLEBITIS
back on his feet
in a week after
recurrent episode[1]

REFRACTORY
CELLULITIS
normal routine
resumed after 4 days
of VARIDASE[1]

Continued from page 1473

pointed by Governor Blair as a member of the Board of Curators of Lincoln University.

Dr. Edward C. Ernst, Sr., St. Louis, received the International Congress of Radiology's top award for 1959. The award was for an exhibit on radium treatment of cancer of the uterus.

Dr. William L. Macon, Jr., St. Louis, has been selected by the American Association of Industrial Nurses as a member of their Medical Advisory Committee.

Dr. Donald C. Proctor, Sedalia, has been elected President of the Breakfast Division of the Optimist Club of Sedalia.

Dr. Frederick B. Campbell, Kansas City, was recently named Vice-President of the American Board of Proctology.

Dr. Richard E. Lord and Dr. Edward H. Reinhard, St. Louis County Medical Society members, will take part in the Eleventh Scientific Assembly of the Missouri Academy.

Dr. Louis L. Tureen, St. Louis, attended scientific clinics in Austria, Denmark, and Germany during the summer and also presented addresses at the University of Tubingen and the University of Hamburg in Germany. He also attended the meeting of the International Congress of Psychoanalysis in Copenhagen, Denmark.

Governor James T. Blair announced the appointment of the State Board of Registration for the Healing Arts. The following are the medical members of the Board: Dr. Ralph Perry, President of the Missouri State Medical Association; Dr. Walter F. Francka, Hannibal, Past President of the Missouri State Medical Association; Dr. Walter Sewell, Springfield, a Past President of the Missouri State Medical Association; Dr. Daniel E. O'Reilly, orthopedic surgeon of St. Louis; and Dr. H. O. Lloyd, internist of Jefferson City.

NORTH CAROLINA

Dr. William M. Coppridge, age 67, Durham, died August 28. Dr. Coppridge had been a member of the Southern Medical Association many years and had a record of having missed very few of the annual meetings. He was Chairman of the Southern Medical Association Section on Urology in 1939, presiding over the Section at the Memphis meeting that year. He represented North Carolina on the Council of the Southern Medical Association which is the governing body, 1942-1946. At the time of his death he was President of the American Urological Association. The Southern Medical Association, urology and organized medicine have lost a fine friend.

The William M. Coppridge Memorial Library for physicians and others engaged in the various paramedical specialties is planned as a living memorial to the memory of Dr. William M. Coppridge.

Dr. Norman M. Sulkin has been appointed Chairman of the Department of Anatomy for The Bowman Gray School of Medicine of Wake Forest College.

Continued on page 80

? What is the diagnosis...

Mrs. X, age 35—physical findings negative.

Complaints: Constipation, alternating with periods of diarrhea, tenesmus, flatulence, colicky pains, easy fatigability, anorexia, periodic dull headaches and muscle pains.

Many times these symptoms point to *E. histolytica*, the parasite most often misdiagnosed,[1] and far more prevalent than generally suspected.[2,3,4]

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1. Elsdon—Dew, R.: S. Afr. Med. J. 32:89 (Jan., 1958)
2. Webster, B. H.: Am. Pract. & Dig. Treat. 9:897 (June, 1958)
3. D'Antoni, J. S.: New Orleans Med. & Surg. J. 102:55 (Aug., 1949)
4. Rinehart, R. E., Marcus, H.: Northwest Med. 54:708 (July, 1955)

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Rheumatoid Arthritis: In "A total of 215 cases...over half, 50.7 per cent showed at least major improvement, with 21.8 per cent showing minor improvement...."[2] **Osteoarthritis:** 301 cases showed "...a total of 44.5 per cent with complete remission or major improvement. Of the remainder, 28.2 per cent showed minor improvement...."[2] **Spondylitis:** All patients "...experienced initial major improvement that was maintained throughout the period of medication."[3] **Painful Shoulder Syndrome:** Response of 70 patients with various forms showed "...8.6 per cent complete remissions, 47.1 per cent major improvement, 20.0 per cent minor improvement...."[2]

References: 1. Graham, W.: Canad. M. A. J. 79:634 (Oct. 15) 1958. 2. Robins, H. M.; Lockie, L. M.; Norcross, B.; Latona, S., and Riordan, D. J.: Am. Pract. Digest Treat. 8:1758, 1957. 3. Kuzell, W. C.; Schaffarzick, R. W.; Naugler, W. E., and Champlin, B. M.: New England J. Med. 256:388, 1957.

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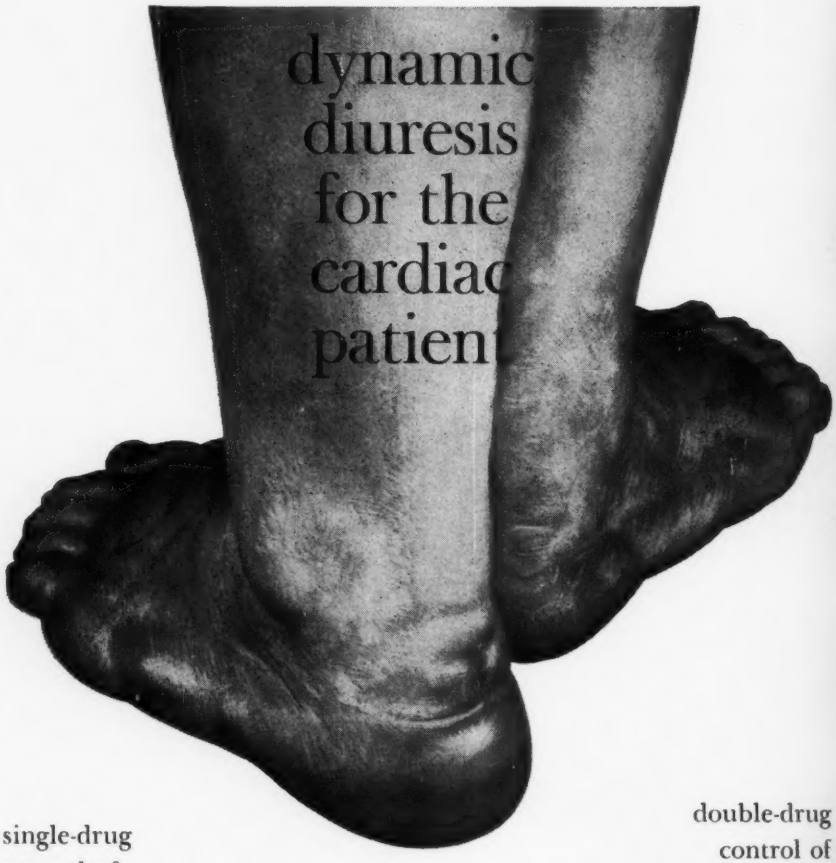

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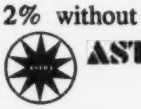

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the complaint: "nervous indigestion"

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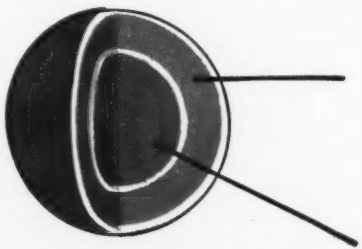

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JAMA, Mar. 28, 1953

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degreases the skin helps remove blackheads dries and peels the skin

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Fostex contains Sebulytic®,* a combination of surface-active wetting agents with remarkable antiseborrheic, keratolytic and antibacterial actions . . . enhanced by sulfur 2%, salicylic acid 2%, hexachlorophene 1%.

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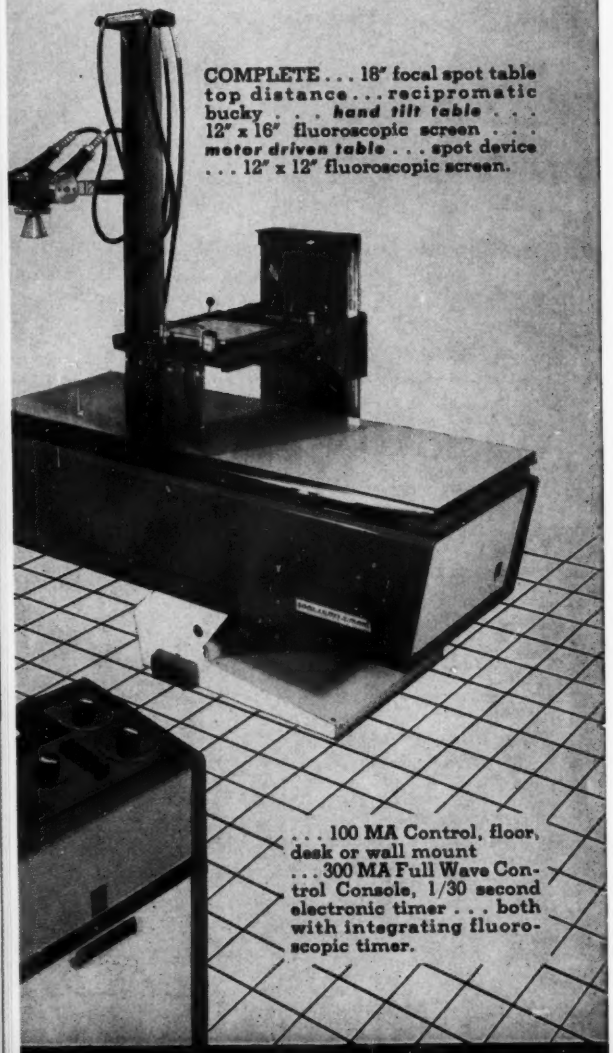

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Continued from page 72

Dr. George W. Paschal, Jr., Raleigh, is General Chairman of the Research Center Fund for Bowman Gray School of Medicine.

OKLAHOMA

New faculty appointments at the Oklahoma Medical Center are the following: Drs. L. C. Kavan, Instructor in Urology; Samuel B. Leslie, Clinical Assistant in Ophthalmology; Frank Gaffney Gatchell, and George F. McDonnold, Clinical Assistants in Surgery.

The new officers of the Oklahoma State Medical Association are as follow: Drs. A. T. Baker, Durant, President; Walter E. Brown, Tulsa, President-Elect; Charles E. Green, Lawton, Vice-President; Johnny A. Blue, Oklahoma City, Secretary-Treasurer; Wilkie D. Hoover, Tulsa, Delegate to the AMA; Joe L. Duer, Woodward, Alternate Delegate to the AMA; Malcom E. Phelps, El Reno, Delegate to the AMA; R. Q. Goodwin, Oklahoma City, Alternate Delegate to the AMA; Clinton Gallaher, Shawnee, Speaker of the House of Delegates; J. Hoyle Carlock, Ardmore, Vice-Speaker of the House of Delegates; and Ben H. Nicholson, Oklahoma City, Editor-In-Chief of the Journal.

Governor Edmondson announced the following members of the State Board of Medical Examiners: Drs. Lillian Robinson, Enid; C. Riley Strong, El Reno, Wayne A. Starkey, Altus; E. C. Northcutt, Ponca City; W. Pat Fite, Muskogee; E. F. Lester, Oklahoma City; and Marshall O. Hart, Tulsa.

Dr. Harris D. Riley, Jr., Department of Pediatrics, University of Oklahoma School of Medicine, was one of the speakers for the Twenty-Fourth Piedmont Graduate Clinical Assembly held in Clemson, South Carolina, in September.

Dr. Edward D. Greenberger, McAlester, attended the Ninth International Congress of Radiology in Munich, Germany during the summer.

Dr. Dayton Royse, Oklahoma City, has joined the staff of the Weatherford Hospital.

SOUTH CAROLINA

The South Carolina Pediatric Society elected the following new officers at its annual meeting in Columbia: Dr. C. E. Zemp, Camden, President; Dr. Kenneth H. Herbert, Charleston, Vice-President; and Dr. Casper Wiggins, Greenwood, Secretary-Treasurer.

Dr. John S. Jachna has transferred to the Columbia Veterans Hospital as Radiologist from the VA Center, Los Angeles, California.

TENNESSEE

Dr. Daniel H. Framm, pediatrician, has joined the staffs of Tepper Clinic and Tepper Hospital in Chattanooga.

Dr. R. R. Bowes, Nashville, was recently conferred the degree of Master of Medical Science by the College of Medical Evangelists at Loma Linda, California.

Dr. Thomas Frist, Nashville, has been named as Co-Chairman of the Governor's Committee to prepare for

Continued on page 84

COMPREHENSIVE, THREE-LEVEL TREATMENT OF DEPRESSION

AND ASSOCIATED ANXIETY AND PHYSICAL TENSION

RELIEVES DEPRESSION
including symptoms such as crying, lethargy, loss of appetite, insomnia

RELIEVES ASSOCIATED ANXIETY
with no risk of drug-induced depression

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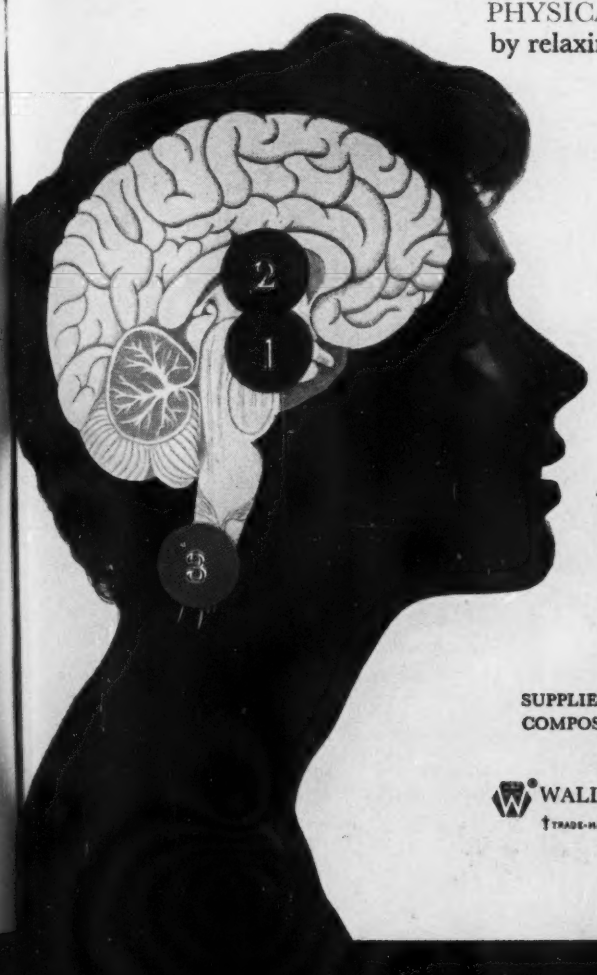

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Dosage: Adults – 2 tsp. 3 or 4 times a day; children 6 to 12 – 1 tsp. 3 or 4 times a day; children under 6 – dosage in proportion.

References: 1. Lhotka, F. M.: Illinois M. J. 112:259 (Dec.) 1957. 2. Fabricant, N. D.: E.E.N.T. Monthly 37:460 (July) 1958. 3. Farmer, D. F.: Clin. Med. 5:1183 (Sept.) 1958. 4. Bickerman, H. A.: in Drugs of Choice, Mosby, St. Louis, 1958, p. 547.

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Continued from page 80

the White House Conference on the Aged, in 1961, by Governor Buford Ellington.

Dr. E. L. Caudill, Sr., has been elected Chief of Staff by the Carter County Memorial Hospital medical staff. Other officers elected are as follow: Drs. E. T. Pearson, Vice-Chief of Staff; W. G. Frost, Head of the Surgical Division; R. J. Allen, Chief of Obstetrics Department; John A. Knapp, Medical Department Head; and Royce Holsey, Secretary-Treasurer.

Dr. W. Webb Wilson, Jackson, recently joined the staff of the Jackson Clinic in the Department of Ophthalmology.

Dr. Robert I. Bourne, Jr., Mt. Pleasant, recently joined the staff of Benton Hospital at Camden.

Dr. Marshall Brucer, Chairman of the Oak Ridge Institute of Nuclear Studies, was presented a special award for his services to the field of pathology by the Board of Governors of the College of American Pathologists and the Executive Committee of the American Society of Clinical Pathologists.

TEXAS

Dr. Curtice Rosser, Dallas, Clinical Professor and Head of the Division of Proctology, University of Texas Southwestern Medical School and member of the Editorial Board of the *Southern Medical Journal*, was one of the recipients of an honorary Fellowship in the International College of Surgeons.

Dr. R. G. McCorkle, Austin, was elected to Fellowship in the International College of Surgeons in September.

Dr. Marc J. Musser, Director of Professional Services at the Houston, Texas Veterans Administration Hospital, has been appointed Director of Medical Research for the Veterans Administration.

Dr. Willard R. Cooke and Dr. H. Reid Robinson have been appointed as Professors Emeritus in the Department of Obstetrics and Gynecology at the University of Texas Medical Branch, Galveston.

Dr. E. E. Muirhead, Dallas, has been named Director of Laboratories for the Woman's Hospital and Professor of Clinical Pathology at Wayne State University College of Medicine in Detroit, Michigan.

Dr. Arild Hansen, Professor of Pediatrics at the University of Texas School of Medicine, Galveston, was presented the Distinguished Service Award by the American Heart Association.

Dr. J. Edward Johnson, Austin, is the new President of the Austin-Travis County Heart Association. Dr. Douglas Terry, Austin, is Vice-President.

Recently appointed Professor and Chairman of the Department of Obstetrics and Gynecology of the University of Texas Medical Branch at Galveston is Dr. William James McGanity, formerly of Nashville.

VIRGINIA

The following new members have been admitted into The Medical Society of Virginia: Drs. Kenneth

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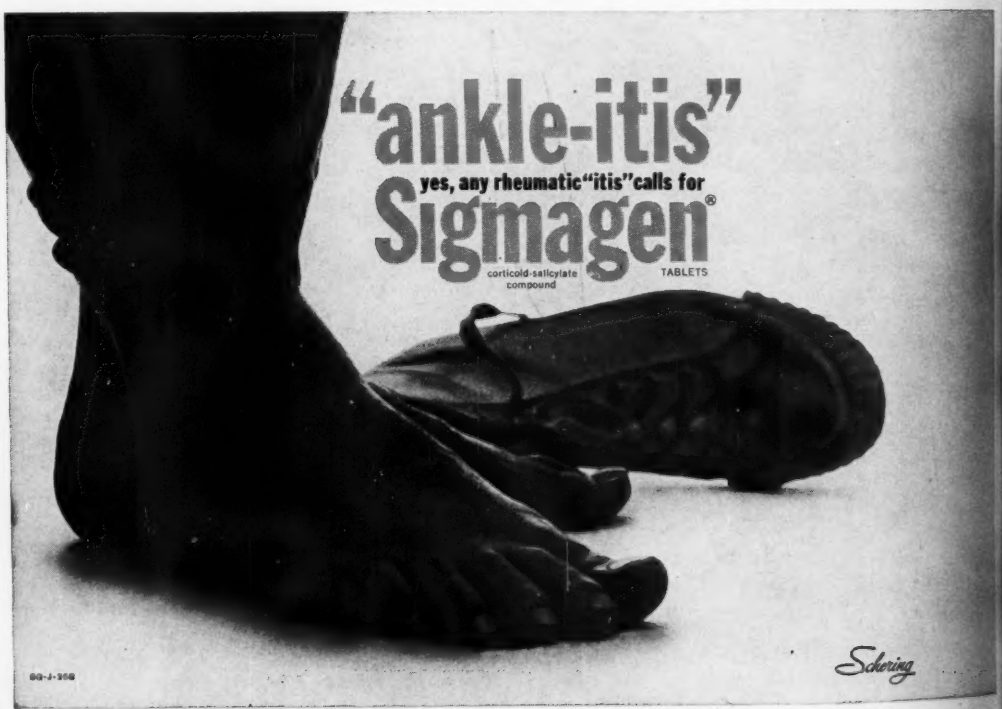

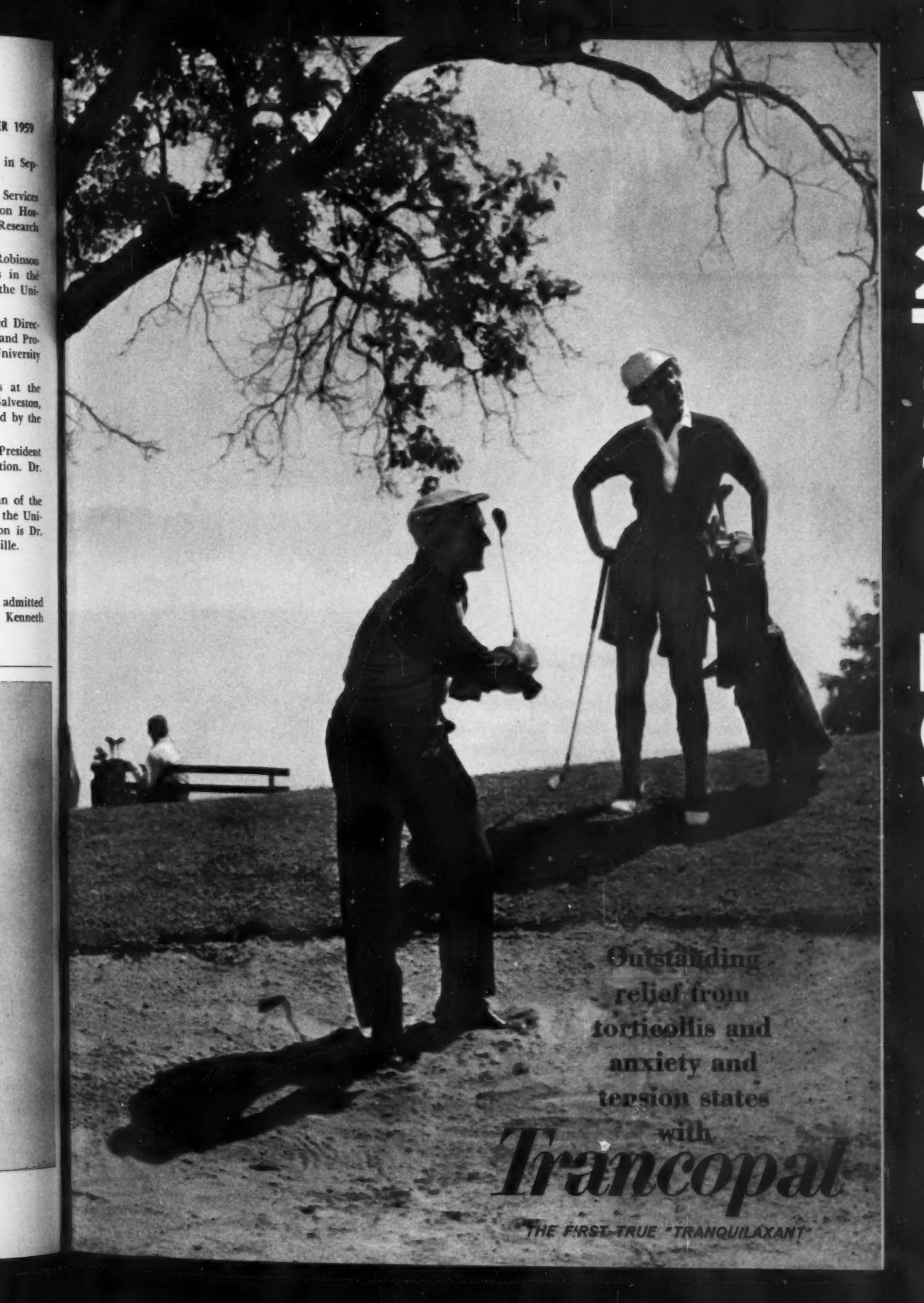
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torticollis and
anxiety and
tension states
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Trancopal
THE FIRST TRUE "TRANQUILAXANT"

Here is what you can expect when you prescribe

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A 55-year-old man complained of a painful, very stiff neck on the left side. There was marked muscle spasm that seemed to involve primarily the trapezius muscle. He had a severe headache, with the pain radiating down the left side of the neck to the shoulder. There were no other findings on physical examination and results of routine laboratory tests were normal.

Trancopal was prescribed in a dosage of 200 mg. q.i.d. The first and second dose of Trancopal gave only moderate relief. However, after the third dose, there was marked relief of the stiffness of the neck, as well as the headache and shoulder pain.

After the fourth dose, medication was gradually decreased and was discontinued on the sixth day. One week later, the patient had moderate recurrence of the torticollis, and Trancopal was again prescribed in doses of 200 mg. q.i.d. The patient obtained complete relief in one day and no further treatment was required.

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for anxiety and tension states

case profile no. 3382*

A 35-year-old woman, a professional model, had an acute, severe attack of anxiety. She was irrational and unable to eat, and was very restless.

Initial medication consisted of aspirin with codeine and later meprobamate. Neither was effective, and the patient's condition became worse. She had to be hospitalized because of the marked anxiety. Trancopal was then prescribed in a dosage of 200 mg. q.i.d., in addition to bed rest.

After the second dose of 200 mg. of Trancopal, the patient became calm and rational, and was able to eat. The dosage of Trancopal was gradually reduced to 100 mg. q.i.d. on the fourth hospital day, after which the patient was discharged and was able to return to her normal occupation.

**Clinical Reports on file at the Department of Medical Research, Winthrop Laboratories.*

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potent MUSCLE RELAXANT
effective TRANQUILIZER

Indications:

Musculoskeletal[1]	Psychogenic[1]
Neck pain (torticollis, etc.)	Anxiety and tension states
Low back pain (lumbago, etc.)	Dysmenorrhea
Bursitis	Premenstrual tension
Rheumatoid arthritis	Asthma
Osteoarthritis	Angina pectoris
Disc syndrome	Alcoholism
Fibrositis	
Ankle sprain, tennis elbow, etc.	
Myositis	
Postoperative muscle spasm	

Dosage: Adults, 100 or 200 mg. orally three or four times daily. Relief of symptoms occurs in fifteen to thirty minutes and lasts from four to six hours. The higher dosage is recommended for the treatment of patients in the acute stages of painful musculospastic conditions, and anxiety and tension states. Children (5 to 12 yrs.), 50 mg. three or four times daily.

Supply:

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100 mg. (peach colored, scored), bottles of 100.

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"Chlormethazanone [Trancopal] not only relieved painful muscle spasm, but allowed the patients to resume their normal activities with no interference in performance of either manual or intellectual tasks."[2]

"The effect of this preparation in these cases [skeletal muscle spasm] was excellent and prompt . . ."[3]

". . . Trancopal is a most valuable drug for relieving tension, apprehension and various psychogenic states."[4]

1. Collective Study, Department of Medical Research, Winthrop Laboratories.
2. Lichtman, A. L. (N.Y. Polyclinic M. Sch. & Hosp.): Kentucky Acad. Gen. Pract. J. 4:28, Oct., 1958.
3. Mullin, W. G., and Epifano, Leonard (Long Island College Hosp.): Am. Pract. & Digest Treat. To be published.
4. Ganz, S. E. (New York, N. Y.): J. Indiana M. A. 52:1134, July, 1959.

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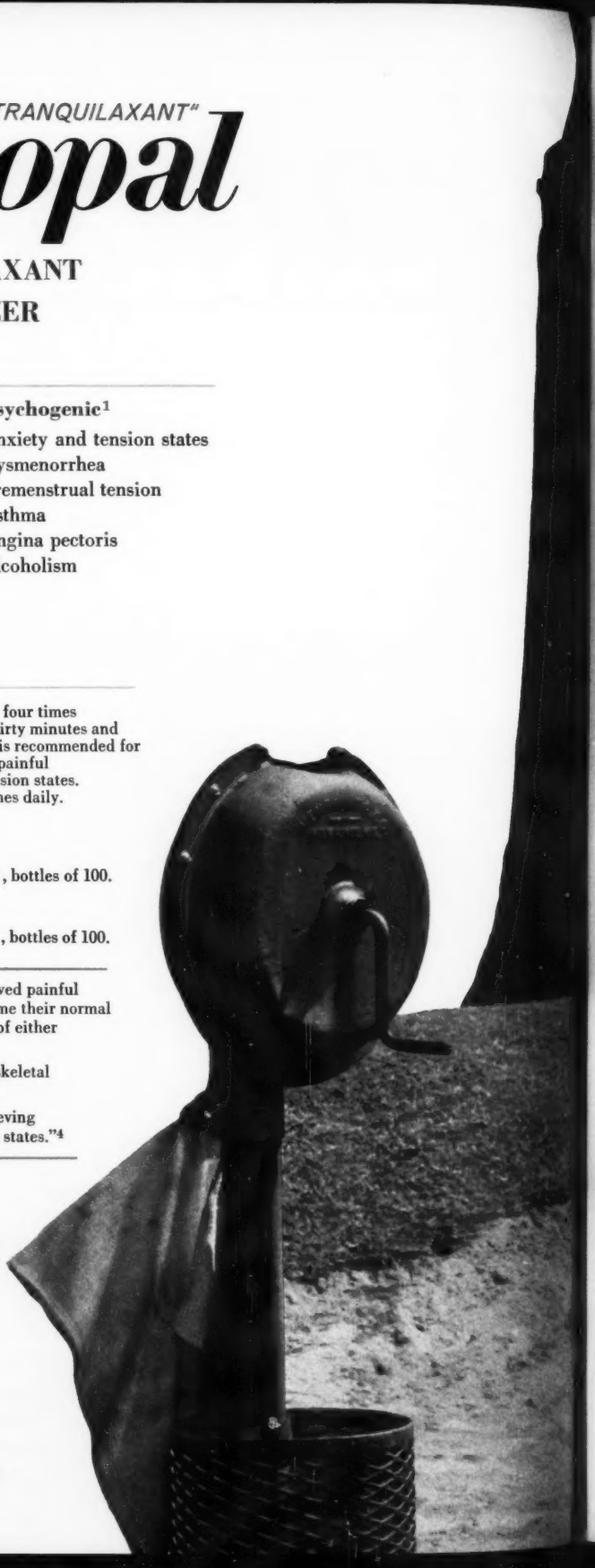

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Sulfadiazine U.S.P.	166.7 mg.
Sulfamerazine U.S.P.	166.7 mg.

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A private hospital for diagnosis and treatment of psychiatric and neurological patients. Hospital and out-patient services.

(Organic diseases of the nervous system, psychoneuroses, psychosomatic disorders, mood disturbances, social adjustment problems, involutional reactions and selective psychotic and alcoholic problems.)

DR. JAMES ASA SHIELD DR. WEIR M. TUCKER
DR. GEORGE S. FULTZ, JR. DR. AMELIA G. WOOD

Continued from page 84

William Berger, Falls Church; Robert A. Orr, Leesburg; Marvin Que Sanner, Alexandria; Wesley Graham Stephen, Troutville; and Earl Edward Virts, Jr., Leesburg.

Dr. Alvah P. Bohannon, Virgilina, who has practiced in that community for 52 years, was recently honored by some 500 residents of his town.

Dr. John W. Massey, Jr., Newport News, has been elected President of the Peninsula Heart Association's Board of Directors.

Dr. Ronald B. Harris, Gill Memorial Eye, Ear and Throat Hospital, Roanoke, has been certified by the American Board of Ophthalmology.

Dr. W. Duane Belt has joined the staff of the Medical College of Virginia as Assistant Professor of Anatomy.

Dr. Warren E. Weaver, Dean of the School of Pharmacy of the Medical College of Virginia, is Chairman of the Program Committee for The American Chemical Society, Southeastern Regional Meeting of Local Sections.

Dr. W. Taliaferro Thompson, Jr., Professor of Medicine of the Medical College of Virginia, has been named to the Board of Trustees of Mary Baldwin College, Staunton.

Dr. Holmes T. Knighton, Professor of Microbiology of the Medical College of Virginia, is the new Presi-

Continued on page 92

oral **METRAZOL**
reactivates the geriatric patient

oral **METRAZOL**
reactivates the convalescent

oral **METRAZOL**
reactivates the fatigued

dosage

for the geriatric patient - 2 tablets or teaspoonfuls, three times daily.
for the convalescent and the fatigued - 1 or 2 tablets or teaspoonfuls, three times daily.

availability

METRAZOL Tablets and Liquidum
Each tablet, 100 mg. METRAZOL. Each teaspoonful, 100 mg. METRAZOL and 1 mg. thiamine.

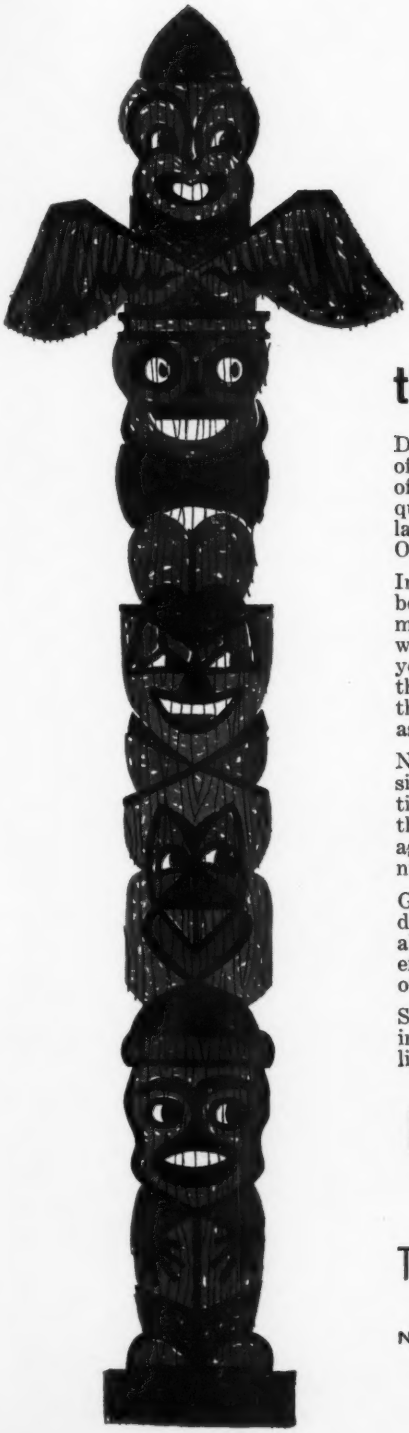
— for those patients who need additional vitamins —

Vita-METRAZOL Elixir and Tablets
Each teaspoonful, 100 mg. METRAZOL, 10 mg. niacinamide, 1 mg. each of thiamine, riboflavin, pyridoxine, and 2 mg. d-panthenol. Each tablet, in addition, 25 mg. vitamin C.

METRAZOL® brand of pentylenetetrazol, E. Bilhuber, Inc.

packaging
Tablets in 100's and 500's. Liquid (wine-like flavored 15 per cent alcoholic solution) in pints.

KNOLL PHARMACEUTICAL COMPANY
(formerly Bilhuber-Knoll Corp.)
Orange, New Jersey



the disease of many masks

Doctor, do you recognize this patient? She complains of flatulence, constipation with alternating periods of diarrhea, and colicky pains in the lower right quadrant. At other times she is troubled by anorexia, lassitude, dull headache, muscle pains and backache. Or she may have only one or two of these symptoms.

In these puzzling cases, serious consideration should be given to intestinal amebiasis—the disease of many masks. Clinicians say it is "one of the most widespread and serious protozoan diseases of man," yet "there is no parasite more often misdiagnosed than is *E. histolytica*." Conservative estimates place the incidence at 10% of the United States population as a whole, and 16% in southern states.

Now Glarubin, a relatively non-toxic amebicide, simplifies the treatment of suspected cases of intestinal amebiasis. Glarubin, a crystalline glycoside from the fruit of *Simarouba glauca*, is a specific amebicidal agent with minimal side effects. It contains no arsenic, bismuth or iodine.

Glarubin is administered orally in tablet form and does not require strict medical supervision or hospitalization. Extensive clinical trials prove it highly effective in intestinal amebiasis, and virtually free of toxicity.

Supplied in bottles of 40 tablets, each tablet containing 50 mg. of glaucarubin. Write for descriptive literature, bibliography, and dosage schedules.

new Glarubin

TABLETS

specific for intestinal amebiasis

THE S. E. MASSENGILL COMPANY

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If one . . . or all . . . needs nutritional support . . .

they
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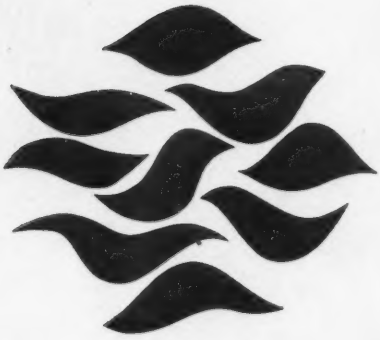
GEVRAL®

capsules—14 VITAMINS AND 11 MINERALS

Vitamin-Mineral Supplement Lederle

For Complete Formula see PDR (Physicians' Desk Reference), page 689

LEDERLE LABORATORIES, a Division of AMERICAN CYANAMID COMPANY, Pearl River, New York



in eight years Novahistine hasn't cured a single cold—but it has brought prompt relief of symptoms to almost 8,000,000 patients*

With the introduction of Novahistine, a better and safer way to relieve symptoms of a cold became available to physicians. The synergistic action of the Novahistine formula...combining an orally-effective vasoconstrictor with an antihistamine...promptly clears the air passages and checks irritant nasal secretions. NOVAHISTINE can eliminate the problem of rebound congestion and damage to nasal mucosa in patients who misuse topical applications. • For long-lasting "Novahistine Effect" prescribe Novahistine LP Tablets...which begin releasing medication as promptly as conventional tablets but continue bringing relief for 8 to 12 hours. Two Novahistine LP Tablets in the morning and two in the evening will effectively control the average patient's discomfort from a cold. Each tablet contains phenylephrine HCl, 20 mg., and chlorprophenpyridamine maleate, 4 mg.

*Based on National Prescription Audits of new Novahistine prescriptions since 1952.

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LONG-ACTING

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GENUINE ENGRAVED
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DIES and PROOFS
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THE INTEGRITY BEHIND THIS NAME
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designed by a urologist for urologists
In rectal examinations:
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Use disposable polyethylene Anushield
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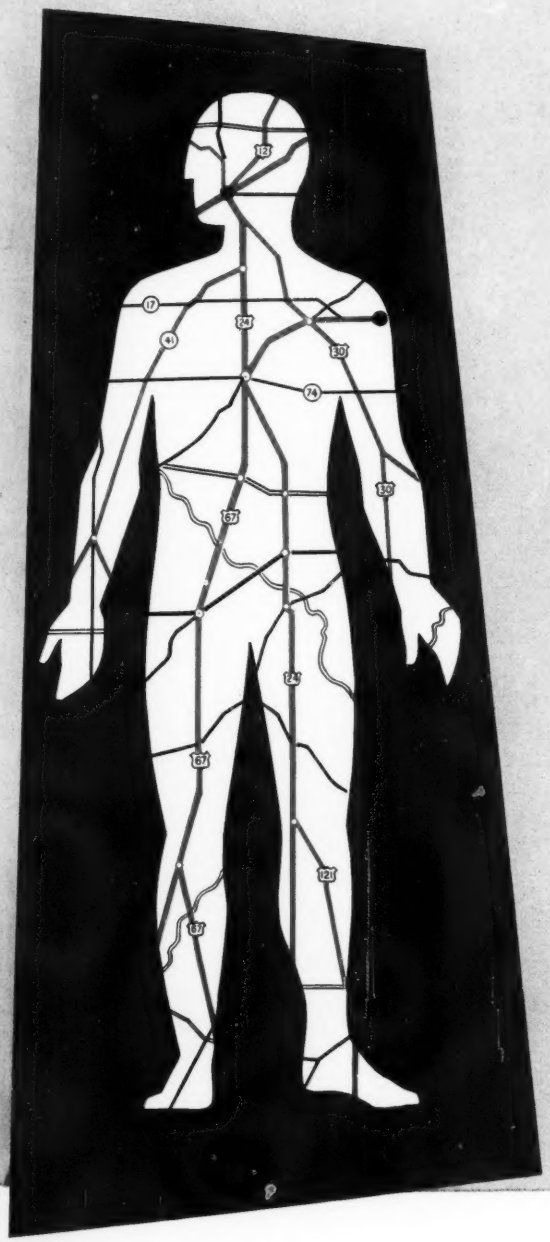
healing
at any location



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Buccal | Aqueous | Oil

superior anti-inflammatory enzyme

controls inflammation, swelling and pain

Chymar averts or rapidly reduces objective and subjective signs of inflammation of all types. It dissipates edema and hematoma, improves local circulation, reduces pain and accelerates healing. Side effects that have been observed with steroid-type anti-inflammatory agents do not occur with Chymar.

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cellulitis
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sprains
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pelvic inflammatory disease
biopsies
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peptic ulcers
dermatoses
conjunctivitis
uveitis

CHYMAR *Buccal* Crystallized chymotrypsin in a tablet formulated for buccal absorption. Bottles of 24 tablets. Enzymatic activity, 10,000 Armour Units per tablet.

CHYMAR *Aqueous* Solution of crystallized chymotrypsin in sodium chloride injection for intramuscular use. Vials of 5 cc. Enzymatic activity, 5000 Armour Units per cc.

CHYMAR Suspension of crystallized chymotrypsin in oil for intramuscular injection. Vials of 5 cc. Enzymatic activity, 5000 Armour Units per cc.

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WANTED—Associate to join EENT group of three doctors on the Texas coast. Want Board certified or eligible in either eye or ENT. Must be willing to do or learn to do some work in other specialty. Contact SC, c/o SMJ.

POSITION WANTED—Experienced Registered Physical Therapist desires position of chief therapist in a small hospital or doctors' clinic or combination thereof. Male, 28, Caucasian, married, veteran. David S. Shelton, 324 South 27th Avenue, Omaha 31, Nebraska.

AVAILABLE—Well established and active general practice with X-ray, B.M.R., Whirlpool, E.K.G., etc., Western Maryland; hospital coverage, educational opportunities; hunting, fishing, swimming, winter sports very good. No cash required. Contact VG, c/o SMJ.

INTERNIST WANTED—New Orleans, Louisiana. Board eligible or certified, to be one of two internists in established seven man clinic. Guaranteed salary initially with subsequent partnership. Address: Dr. Daniel W. Hayes, Sellers and Sanders Clinic, 4414 Magnolia Street, New Orleans 15, Louisiana.

WANTED—Experienced Radiologist, board certification not required but preferred, to head Radiology Service of busy, modern, fully equipped, Veterans Administration Outpatient Medical Clinic, located in downtown Montgomery, Alabama. Desirable vacation with pay, annual and sick leave benefits, and retirement benefits. Good opportunity for advancement. Salary range $9,890 to $13,970 depending on experience and whether board certified. Must be U. S. citizen. Write, wire or phone Director, Professional Services, Outpatient Clinic, 400 Lee Street, Montgomery, Alabama.

WANTED—General practitioner or internist for Outpatient Department of VA Hospital, Birmingham, Alabama. Female physician acceptable. Stimulating medical center atmosphere, scheduled 40-hour work week, desirable vacation and retirement benefits, good opportunity for advancement. Salary according to qualifications. Must be U. S. citizen. Write Director, Professional Services, VA Hospital, Birmingham, Alabama.

Continued from page 86

dent-Elect of the International Association for Dental Research.

Dr. George Margolis was recently appointed Chairman of the Department of Pathology of the Medical College of Virginia.

WEST VIRGINIA

Dr. Jacob C. Huffman, Buckhannon, has been installed as President of the West Virginia State Medical Association. Other officers are: Drs. D. E. Greeneltch, Wheeling, Vice-President; Daniel N. Barber, Charleston, Treasurer; and John W. Hash, Charleston, President-Elect.

The following new members of the Council of the West Virginia State Medical Association were elected: Drs. Richard E. Flood, Wierton, First District; Justus C. Pickett, Morgantown, Second District; A. C. Esposito, Huntington, Fourth District; Harold Van Hoose, Man, Fifth District; and Clyde A. Smith, Beckley, Sixth.

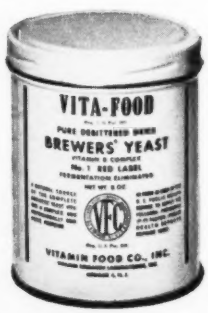
Dr. C. R. Davisson, Weston, was re-elected for his second term as a member of the Council from the Third District.

Dr. Frank J. Holroyd, Princeton, was re-elected AMA delegate from West Virginia. Dr. Thomas G. Reed, Charleston, was renamed to a two year term as AMA alternate.

Dr. Charles M. Scott, Bluefield, was elected President of the West Virginia Chapter of the Medical College of Virginia Alumni Association.

Dr. Thomas S. Knapp, Charleston, has been appointed part-time psychiatrist for the Kanawha County Court.

Continued on page 100



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"The possibilities of yeast as human food deserves more technological attention. Two major defects in many modern diets are relatively small provision of certain vitamins of the B complex and insufficiency of biologically superior protein. Both deficiencies could be limited by using yeast as food."*

VITA-FOOD, genuine brewers' yeast, supplies nearly 50% of nutritionally complete protein plus the whole vitamin B complex.

*Wilder & Keys, "Handbook of Nutrition," A.M.A. 1943.

VITA-FOOD
BREWERS' YEAST

THE BUFFERED
ACID VAGINAL DOUCHE
BUFFERED
TO MAINTAIN
AN ACID pH*

*See reverse side for detail.

Mildly astringent soothing inflamed tissue

•

Low surface tension effectively penetrating vaginal folds

•

"Clean" refreshing odor assuring patient acceptance

•

Valuable adjunct in management of monilia, trichomonas, staphylococcus and streptococcus vaginal infections.

MASSENGILL® POWDER

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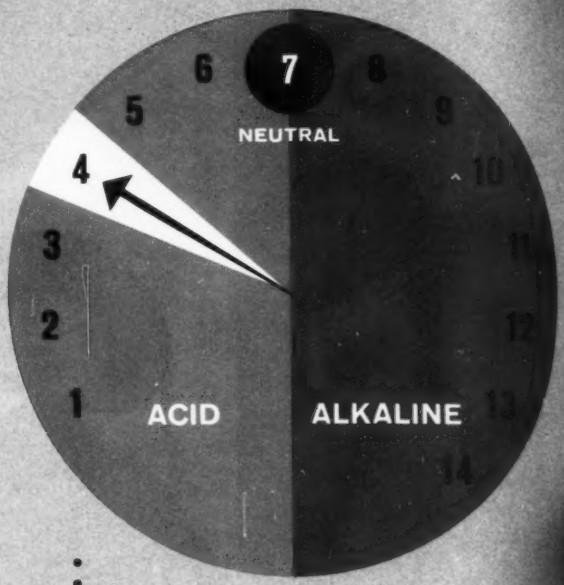
pH



massengill® powder

The **BUFFERED** *acid vaginal douche*

What is a BUFFER?

Medical dictionaries define it as a substance which, added to a solution, causes resistance to any change of hydrogen-ion concentration (pH) when either acid or alkali is added.

Significance of buffers in Massengill Powder

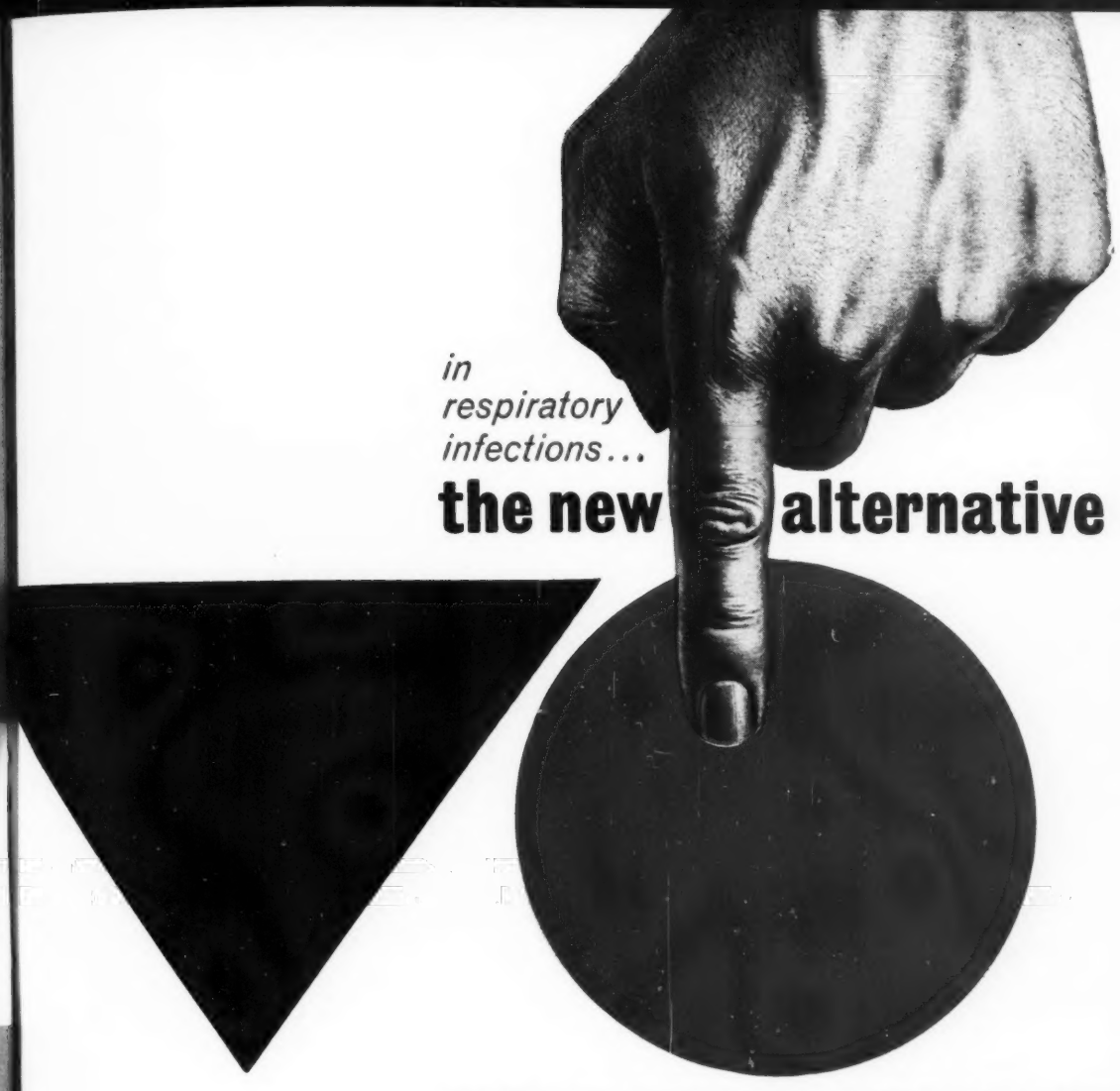
The normal vagina has a pH of 3 to 4.5. This low pH inhibits growth of most pathogenic invaders. Usually, an infection will cause the pH to rise to the neutral or alkaline range which favors the multiplication of pathogens.

The alkaline mucosa neutralizes a simple, unbuffered acid douche, like vinegar, within 30 minutes.

In contrast, the *buffered* acid douche solution of Massengill Powder (pH 3.5-4.5) resists neutralizing. The normal, low pH is maintained for 4 to 6 hours and as long as 24 hours in recumbent patients. This low pH inhibits the propagation of monilia, trichomonas vaginalis and pathogenic bacteria. However, the beneficial Döderlein bacillus thrives in this pH range.

THE S. E. MASSENGILL COMPANY

Bristol, Tennessee • New York • Kansas City • San Francisco



in respiratory infections...

the new alternative

MADRIBON

Backed by the fastest growing bibliography of any anti-infective agent, Madribon is already widely established as the new alternative because (1) it quickly controls the infection —in more than 90% of reported cases, including some due to resistant strains; (2) it is safe—less than 2% side effects, generally of a mild nature; (3) it is economical.

MADRIBON●—2,4-dimethoxy-6-sulfanilamido-1, 3-diazine
MADRIQID™ ROCHE●

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NOW... for pediatric practice
MADRIBON Pediatric Drops
AND... when q.i.d. dosage is desirable **MADRIQID**

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MERCK SHARP & DOHME announces two new programs in its series of televised medical reports to the American public:

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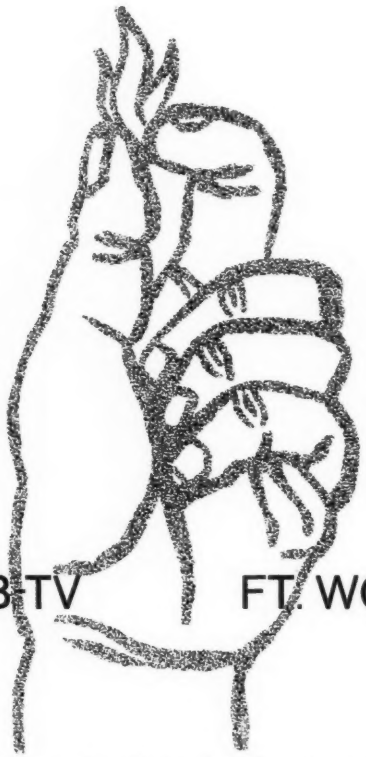
GERIATRICS—the medical and social implications of our increasing life-span. In cooperation with the SOUTHERN MEDICAL ASSOCIATION from the 53rd Annual Meeting.



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SOLAR RADIATION—and its effects, beneficial and otherwise, on the life processes. In cooperation with the AMERICAN MEDICAL ASSOCIATION from the 1959 Clinical Meeting.

ATLANTA WSB-TV CHANNEL 2
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Your patients will not want to miss these informative programs. Check newspaper TV listings for local times and channels.

Watch for future programs in the series, "ASK YOUR DOCTOR", produced as a service to the medical profession by MERCK SHARP & DOHME
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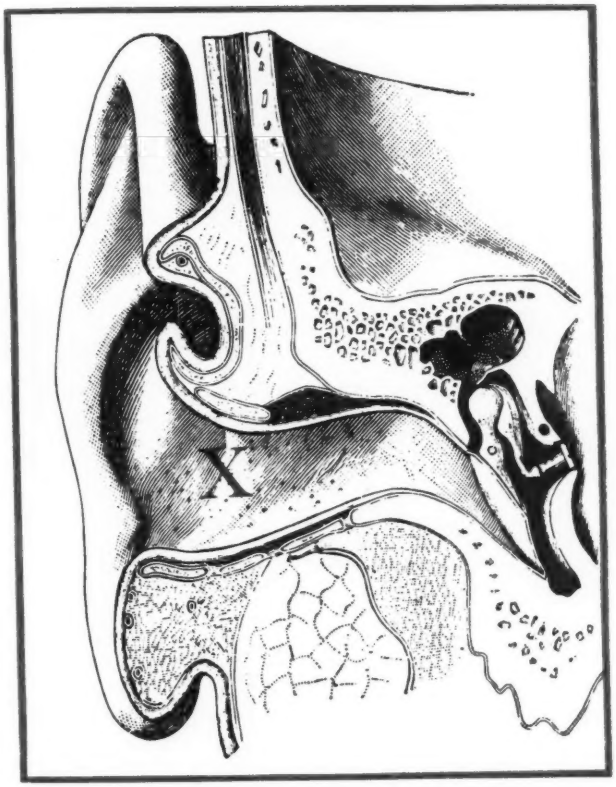

"...BETTER RESULTS THAN EVER BEFORE..."* IN

OTITIS EXTERNA

AND CHRONIC OTITIS MEDIA WITH

OTOBIOTIC®

ANTIBIOTIC / ANTIFUNGAL **EAR DROPS**

3.5 mg. neomycin (from sulfate) and 50 mg. sodium propionate per cc. — in 15 cc. dropper bottles.

*Lawson, G. W.: Diffuse Otitis Externa and Its Effective Treatment, Postgrad. Med. 22:501, (Nov.) 1957.

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"... which antacid? Rorer's Maalox. Excellent results, no constipation plus a pleasant taste that patients like."

MAALOX® an efficient antacid suspension of magnesium-aluminum hydroxide gel offered in bottles of 12 fluidounces.

TABLET MAALOX: 0.4 Gram (equivalent to one teaspoonful), Bottles of 100.

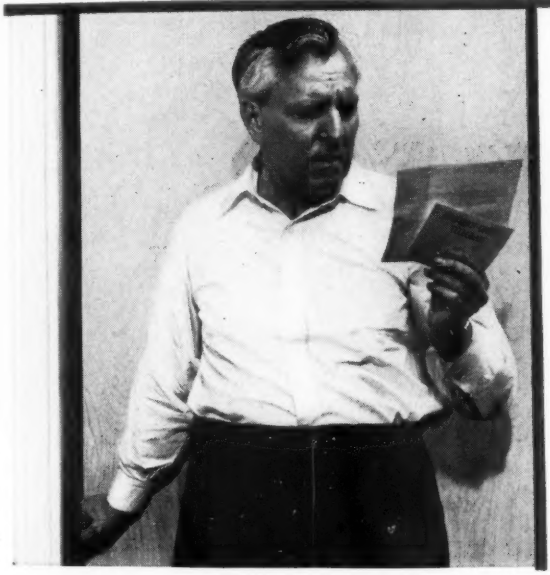
TABLET MAALOX No. 2: 0.8 Gram, double strength (equivalent to two teaspoonfuls), Bottles of 50 and 250.

Samples on request.

WILLIAM H. RORER, INC., Philadelphia 44, Pennsylvania

In Coronary Insufficiency . . .

Your high-strung angina patient often expends a "100-yd. dash" worth of cardiac reserve through needless excitement.



Curbs emotion as it boosts coronary blood supply

CONTROL OF EMOTIONAL EXERTION with Miltrate leaves him more freedom for physical activity.

IMPROVED CORONARY BLOOD SUPPLY with Miltrate increases his exercise tolerance.

Miltrate*

Miltown® (*meprobamate*) + PETN

Each tablet contains: 200 mg. Miltown and 10 mg. pentaerythritol tetranitrate.

Supplied: Bottles of 50 tablets.

Usual dosage: 1 or 2 tablets q.i.d. *before meals* and at bedtime. Dosage should be individualized.

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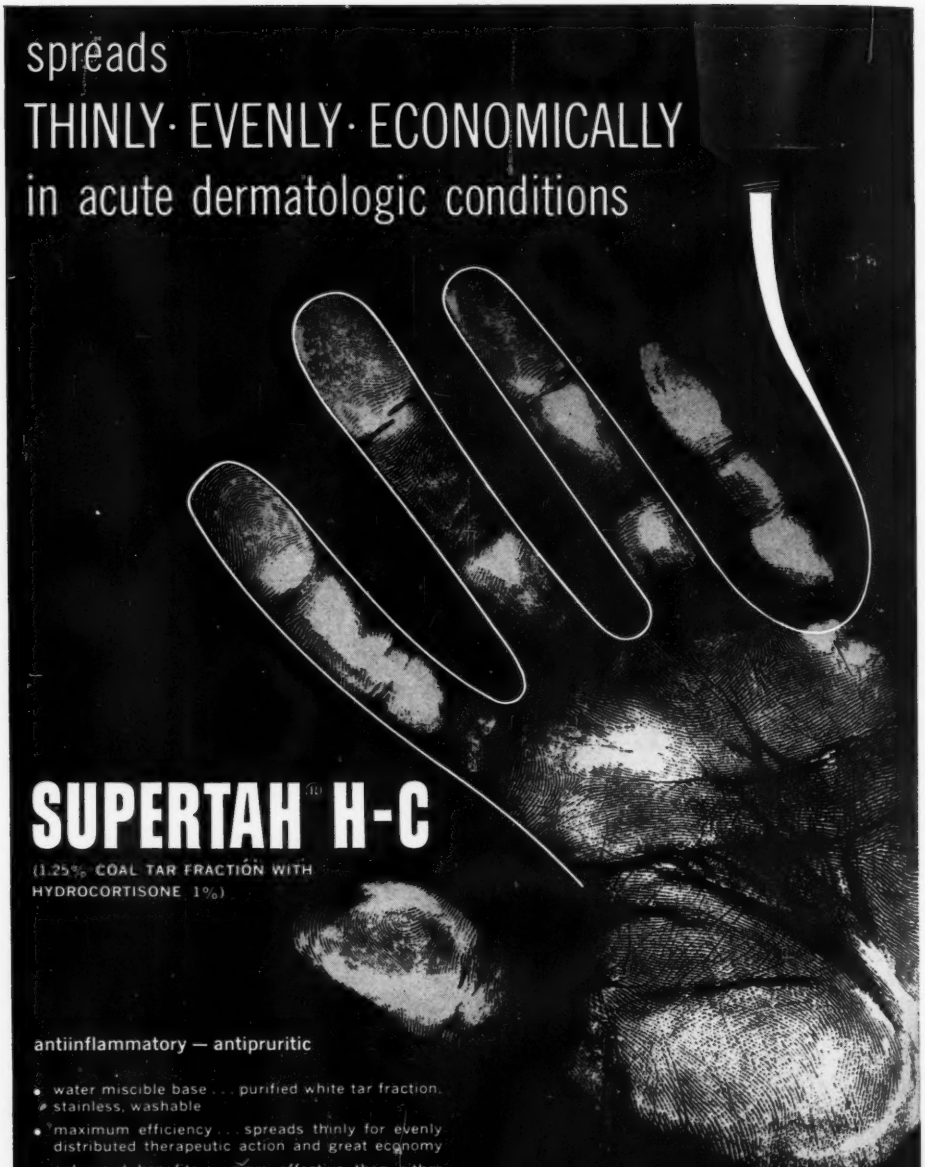
spreads
THINLY · EVENLY · ECONOMICALLY
in acute dermatologic conditions



SUPERTAH® H-C
(1.25% COAL TAR FRACTION WITH HYDROCORTISONE 1%)

antiinflammatory — antipruritic

- water miscible base . . . purified white tar fraction, stainless, washable
- maximum efficiency . . . spreads thinly for evenly distributed therapeutic action and great economy
- enhanced benefits . . . more effective than either agent alone
- excellent response . . . deep penetration to source of inflammation

supplied: ½-oz. tube

also available:
SUPERTAH Ointment (1½-oz. tube)
provides the therapeutic effectiveness of time-proved tar medication
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for keratolytic action

All Supertah preparations are made with refined natural coal tar fraction

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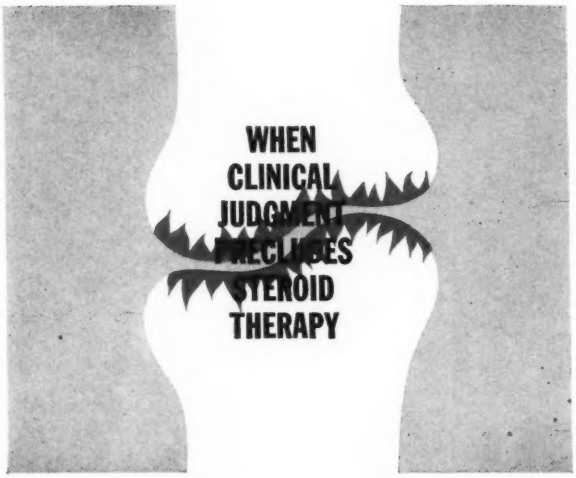

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THE SAFE ANTI-ARTHRITIC AND ANTIRHEUMATIC THAT CONTAINS THE IMPORTANT PLUS OF ORGANIDIN® FOR THE FURTHER CONTROL OF INFLAMMATION AND TO AID IN THE RESORPTION OF NECROTIC TISSUE

Sodium-free, potassium-free ARTAMIDE is especially valuable when clinical judgment precludes steroid therapy. ARTAMIDE provides higher salicylate blood levels[1] with lower dosage. Antirheumatic, anti-inflammatory, analgesic . . . ARTAMIDE aids normal corticosteroid activity. The inclusion of ORGANIDIN, the smoother, safer, organically bound iodine, greatly increases the effectiveness of the ARTAMIDE formula by stimulating the resorptive processes[2] and further controlling inflammation. **ARTAMIDE provides symptomatic relief as well as important gains in functional capacity for many patients who cannot tolerate corticosteroids.**

Each ARTAMIDE tablet contains: Salicylamide 0.25 Gm. (4 gr.); Para-aminobenzoic Acid 0.25 Gm. (4 gr.); Ascorbic Acid 20.0 mg. (⅓ gr.); ORGANIDIN® (iodinated glycerol) 20.0 mg. (⅓ gr.).

DOSAGE: 2 tablets 3 or 4 times daily. Requirements may vary according to the response of the patient. **SUPPLIED:** ARTAMIDE Tablets, bottles of 100 and 500. **REFERENCES:** 1. Chambers, James O.: Clinical Medicine, 61:3 (1954) pp. 203-205. 2. Salter, W. T.: A Textbook of Pharmacology, p. 603, W. B. Saunders Co. (1952).

WRITE: Professional Service Department for literature and trial supply.

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MUMPS VACCINE

Specific immunizing antigen (chick embryo origin) active against various isolated virus strains. Effectively prevents or modifies mumps in children and adults.

Lederle LEDERLE LABORATORIES, A Division of AMERICAN CYANAMID CO., Pearl River, N.Y.

Continued from page 92

The following new faculty members were added to the West Virginia University School of Medicine staff: Drs. Alexander D. Kenny, Department of Pharmacology as Associate Professor; Robert L. Robinson, Department of Pharmacology as Instructor; Wilbert E. Gladfelter, Department of Physiology as Instructor; and Thomas R. Argiro, Department of Pathology as Instructor.

The new President of the West Virginia Academy of Ophthalmology and Otolaryngology is Dr. Nime K. Joseph, Wheeling. Other officers are as follow: Dr. John A. B. Holt, Charleston, President-Elect; Dr. William K. Marple, Huntington, Vice-President; Dr. Albert C. Esposito, Huntington, Secretary-Treasurer; and Dr. James T. Spencer, Charleston, and Dr. William F. Beckner, Huntington, Directors.

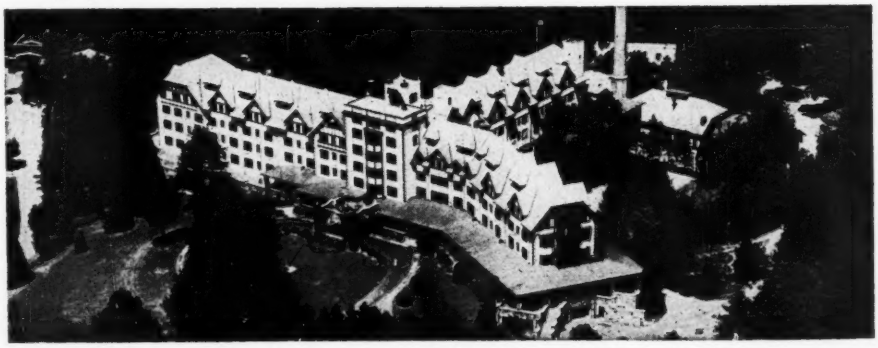
Dr. Ralph H. Nestmann, Charleston, has been re-elected President of the West Virginia Tuberculosis and Health Association.

Dr. Charles N. Slater, Clarksburg, was presented a plaque for being named West Virginia's "General Practitioner of the Year" at the West Virginia State Medical Association's annual meeting in August.

Dr. William P. Bittinger, Summerlee, and Dr. Doff D. Daniel, Beckley, have been reappointed members of the West Virginia Medical Licensing Board by Governor Cecil H. Underwood.

Governor Underwood reappointed Dr. Hu C. Myers, Philippi, as a member of the Advisory Board to the State Board of Health on Hospital Licensing.

Appalachian Hall • ESTABLISHED 1916 Asheville, North Carolina



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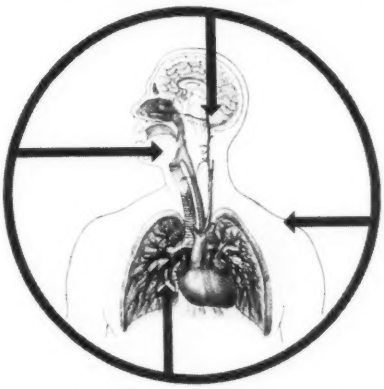
Insulin Coma, Insulin Sub-Shock, Electroshock and Psychotherapy are employed. The Institution is equipped with complete laboratory facilities including electroencephalography and X-ray.

Appalachian Hall is located in Asheville, North Carolina, a resort town, which justly claims an all around clime for health and comfort. There are ample facilities for classification of patients, rooms single or en suite.

WM. RAY GRIFFIN, JR., M.D.
ROBERT A. GRIFFIN, M.D.
MARK A. GRIFFIN, M.D.
MARK A. GRIFFIN, JR., M.D.

For rates and further information write APPALACHIAN HALL, ASHEVILLE, N. C.

Now—All cold symptoms can be controlled



Tussagesic

timed-release tablets

Controls congestion

with **Triaminic,**[1,2,3] **the leading oral nasal decongestant.**

Controls aches and fever

with well-tolerated APAP, non-addictive analgetic[4] and excellent antipyretic.[5]

Each TUSSAGESIC Tablet provides:

TRIAMINIC®	50 mg.
(phenylpropanolamine HCl	25 mg.
pheniramine maleate	12.5 mg.
pyrilamine maleate	12.5 mg.)
Dormethan (brand of dextromethorphan HBr)	30 mg.
Terpin hydrate	180 mg.
APAP (N-acetyl-p-aminophenol)	325 mg.

References: 1. Lhotka, F. M.: Illinois M. J. 112:259 (Dec.) 1957. 2. Fabricant, N. D.: E.E.N.T. Monthly 37:460 (July) 1958. 3. Farmer, D. F.: Clin. Med. 5:1183 (Sept.) 1958. 4. Bonica, J. J.: in Drugs of Choice, Mosby, St. Louis, 1958, p. 272. 5. Dascomb, H. E.: in Current Therapy, Saunders, Phila., 1958, p.78. 6. Bickerman, H. A.: in Drugs of Choice, Mosby, St. Louis, 1958, p.547.

Controls cough centrally

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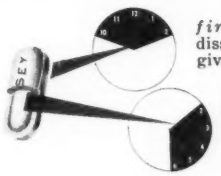

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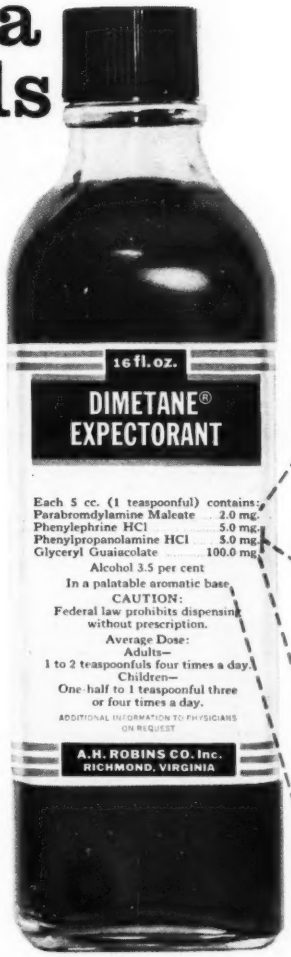

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*Gauss, H.: Biliary Constipation, Am. J. Digest. Dis. *10*:141 (April) 1943

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Conference Headquarters—Roosevelt Hotel

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Dermatology
Henry D. Janowitz, M.D., New York, N. Y.
Gastroenterology
John G. Walsh, M.D., Sacramento, Calif.
General Practice
E. Stewart Taylor, M.D., Denver, Colo.
Gynecology
Charles H. Burnett, M.D., Chapel Hill, N. C.
Internal Medicine
To be announced
Internal Medicine
Donald D. Matson, M.D., Boston, Mass.
Neurosurgery
Frank R. Lock, M.D., Winston-Salem, N. C.
Obstetrics
Trygve Gundersen, M.D., Boston, Mass.
Ophthalmology
Carroll B. Larson, M.D., Iowa City, Iowa
Orthopedic Surgery
John J. Conley, M.D., New York, N. Y.
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(1) Estimate based on epidemiologic study by Van Volkenburgh, V. A., and Frost, W. H.: Am. J. Hygiene 71:122, Jan. 1933.

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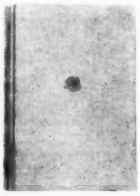
Question:
Why do so many physicians prefer Cafergot and Cafergot P-B for migraine and other recurrent throbbing headaches?

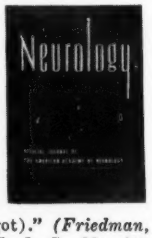
Answers:
By leading clinicians, quoted from their published investigations.

"The highest percentage (83%) of patients with symptomatic relief is obtained by early and adequate administration of ergotamine and caffeine (Cafergot), alone or combined with antispasmodics and/or sedatives (Cafergot P-B)." *(Friedman, A. P.: J.A.M.A. 163:1111, March 30, 1957.)*



"For those patients in whom nausea and vomiting occur so early in the attack that oral medication cannot be used, rectal administration is sometimes a simple and effective solution. Cafergot suppositories... and Cafergot P-B suppositories... are useful additions to the armamentarium." *(MacNeal, P. S., et al.: Management of the Patient with Headache, 1957.)*

"The tablets [Cafergot P-B] were especially useful when the headaches were accompanied by nervous tension and gastrointestinal upset.... Cafergot P-B Tablets constitute an important addition to the treatment of vascular headache." *(Blumenthal, L. S., and Fuchs, M.: Med. Annals District of Columbia 26:175, April 1957.)*



"Symptomatic treatment is essentially one of pharmacotherapy, and the best results have been obtained with the use of ergotamine derivatives, notably a compound of ergotamine and caffeine (Cafergot)." *(Friedman, A. P., von Storch, T. J. C., Merritt, H. H.: Neurology 4:773, Oct. 1954.)*

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ergotamine tartrate 1 mg., caffeine 100 mg.
Dosage: 2 at first signs of attack; if needed, 1 additional tab. every ½ hour until relieved (max. 6 per attack).

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Dosage: 1 as early as possible in attack; second in one hour, if needed (max. 2 per attack).

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